PACKAGE engineering

In this issue—

Program of the AMA National Packaging Conference and list of exhibitors at the National Packaging Exposition Starting on Page 41.

When is a packaging line ready to run?

Taking a look at performance standards (quality, efficiency, results) that a new line must meet before it passes from the development stage to full scale production. (See page 23)

Nitrogen: Pressurized package propellant

A review of this inert gas as a propellant and a discussion of its properties, as well as those of products going into such packages, together with details of nitrogen usage determination. (See page 28)

Close fit for case marking equipment

Having to code-mark the ends (rather than the sides) of cases dictated development of special machinery because of the available space being too small for a standard equipment installation. (See page 46)

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MAY 1958

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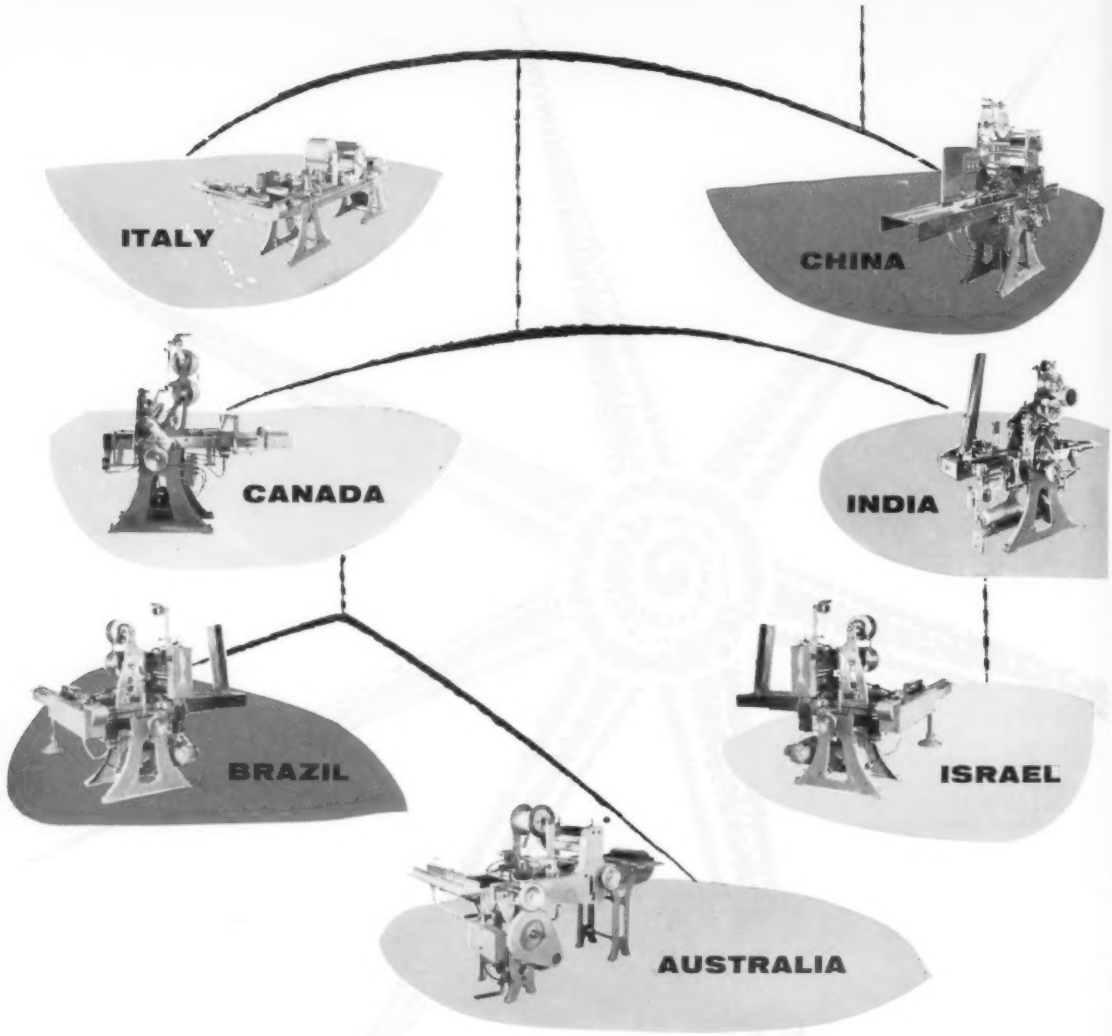

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Aluminum Foil Packaging–Flavor Retention

Report No. 15 of a Series by Reynolds Metals Company

FLAVOR is the main quality or characteristic upon which repeat sales of packaged foods or food products depend. A package can look good and provide a maximum of convenience...but it will not be purchased a second time if it did not adequately preserve the flavor of its contents the first time.

A food processor may use the finest ingredients prepared with the most modern equipment under the supervision of the best chefs...but the fine flavor, which is at its peak immediately after preparation, can be lost within a few hours if it is not protected by the proper packaging materials.

Causes of Flavor Loss

Several of the more important causes of flavor loss are:

1. Chemical changes in the food such as oxidation or hydrolysis (both greatly accelerated by light, moisture and air).
2. Absorption of foreign flavors from the packaging material or through it.
3. Direct loss of volatile flavorings through the packaging material.
4. Bacteria and mold.

Aluminum foil provides a powerful means of combating flavor deterioration from such causes. It is opaque, preventing harmful light from catalyzing oxidation or other chemical reactions. It protects against flavor-destroying oxygen and moisture. Aluminum itself is odorless, tasteless and non-toxic. Its low moisture and gas permeability minimize the entry of foreign odors and the escape of volatile flavors. And, in addition, aluminum foil is an effective component for vacuum and gas packaging, both of which retard bacterial changes.

The accompanying three graphs show how aluminum foil helps retain the original flavor of packaged food products subjected to different forms of flavor loss.

Fig. I illustrates the lowering of butter quality due to outside flavor contamination. Grade A butter wrapped in aluminum foil and in parchment was stored at 40°F in a refrigerator with onions, cabbage and garlic. In three days, the parchment-wrapped butter had dropped to a score of 88—cooking grade—while the aluminum-wrapped butter maintained its original 92 score.

Protects Against Rancidity

Fig. II indicates how quickly flavor can be lost through chemical change. Potato chips in aluminum foil bags, wax-glassine bags, double cellophane bags and polyethylene bags were exposed to an RS 275 watt sunlamp four feet away. In less than three days, the potato chips in translucent and transparent packaging had developed a pronounced rancidity whereas the aluminum-packaged potato chips maintained good flavor after thirteen days. These losses were attributed to oxidation, a cause of even more rapid deterioration of certain other foods when they are not protected against light or air.

Loss of a volatile flavor ingredient is shown in Fig. III. Puffed mint candy was stored at 100°F. Candy wrapped in heat-sealed aluminum foil retained "very good" mint flavor after six weeks, while the candy in heat-sealed cellophane had lost nearly all its mint flavor in that time.

Aluminum foil packaging thus assures a maximum of repeat sales by protecting flavor more efficiently than any other flexible packaging material. For further information on this and other phases of aluminum packaging protection, call the nearest Reynolds sales office. Or write to **Reynolds Metals Company**, General Sales Office, Louisville 1, Kentucky

Watch Reynolds All-Family Television Program "DISNEYLAND", ABC-TV.

©1958 by Reynolds Metals Company

FIG. I

SCORE OF BUTTER STORED AT 40°F WITH ONION, CABBAGE AND GARLIC

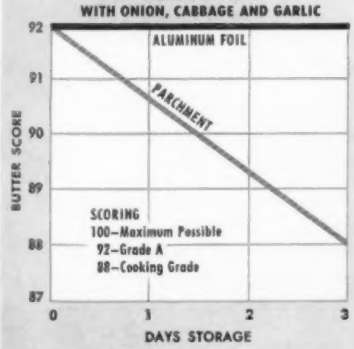


FIG. II

FLAVOR LOSS OF POTATO CHIPS EXPOSED TO RS 275 WATT SUNLAMP 4 FEET DISTANT

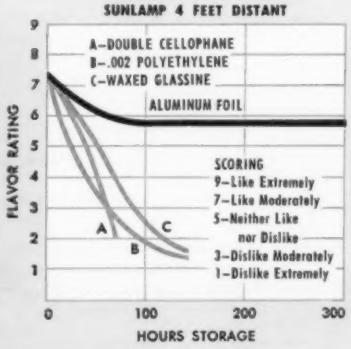
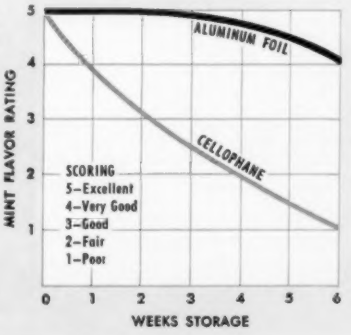


FIG. III

FLAVOR LOSS OF MINTS STORED AT 100°F



For your calendar

May 8-10. Western Industrial Packaging and Material Handling Show, Great Western Exhibit Center, Los Angeles. Contact: J. M. Druliner, American Material Handling Society, 2807 Sunset Blvd., Los Angeles 26, California. *Telephone: DU-5-7442.*

May 25-29. Institute of Food Technologists, 18th Annual Meeting, Palmer House, Chicago. Contact: Charles S. Lawrence, executive secretary, Institute of Food Technologists, 176 W. Adams Street, Chicago 3, Illinois. *Telephone: Andover 3-6268.*

May 26-28. AMA National Packaging Conference, Hotel Statler, New York. Contact: E. King Graves, American Management Association, 1515 Broadway, New York 36, New York, *Telephone: Judson 6-8100.*

May 26-30. AMA National Packaging Exposition, New York Coliseum, New York. Contact E. King Graves, American Management Association, 1515 Broadway, New York 36, New York. *Telephone: Judson 6-8100.*

August 11-13. Western Packaging & Materials Handling Exposition, San Francisco Civic Auditorium. Contact: Exposition Office, 759 Monadnock Building, San Francisco 5, California. *Telephone: Douglas 2-7876.*

September 29. Fourth Joint Military-Industry Packaging and Materials Handling Symposium, sponsored by the Department of the Navy in cooperation with other military departments and the Department of Commerce, in Washington, D.C. Contact: Head, Packaging Section, Supply Programs Division, Office of Naval Material, Washington 25, D.C. *Telephone: Liberty 5-6700, Ext. 61061.*

October 13-15. Packaging Institute, 20th Annual Forum, Edgewater Beach Hotel, Chicago, Illinois. Contact: Charles A. Feld, executive director, Packaging Institute, 342 Madison Avenue, New York 17, New York. *Telephone: Murray Hill 7-8875.*

October 14-16. Society of Industrial Packaging and Materials Handling Engineers, 13th National Industrial Packaging and Handling Exposition, and SIPMHE short course, Chicago Coliseum, Chicago, Illinois. Contact: C. J. Carney, managing director, Society of Industrial Packaging and Materials Handling Engineers, Suite 1534, 14 E. Jackson Blvd., Chicago 4, Illinois. *Telephone: Harrison 7-6123.*

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PACKAGE engineering

AN ANGUS J. RAY PUBLICATION

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Setting tolerances, developing standards, and inspecting the result of packaging line efficiency and quality before releasing the line from its development stage to that of full-scale production.

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A discussion of its properties, a review of product characteristics, and gas solubility in a product, and specific details of nitrogen usage determination.

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52 How packaging information flows through a manufacturing organization, by Duane O. Culligan, administrative engineer, Florence Stove Company
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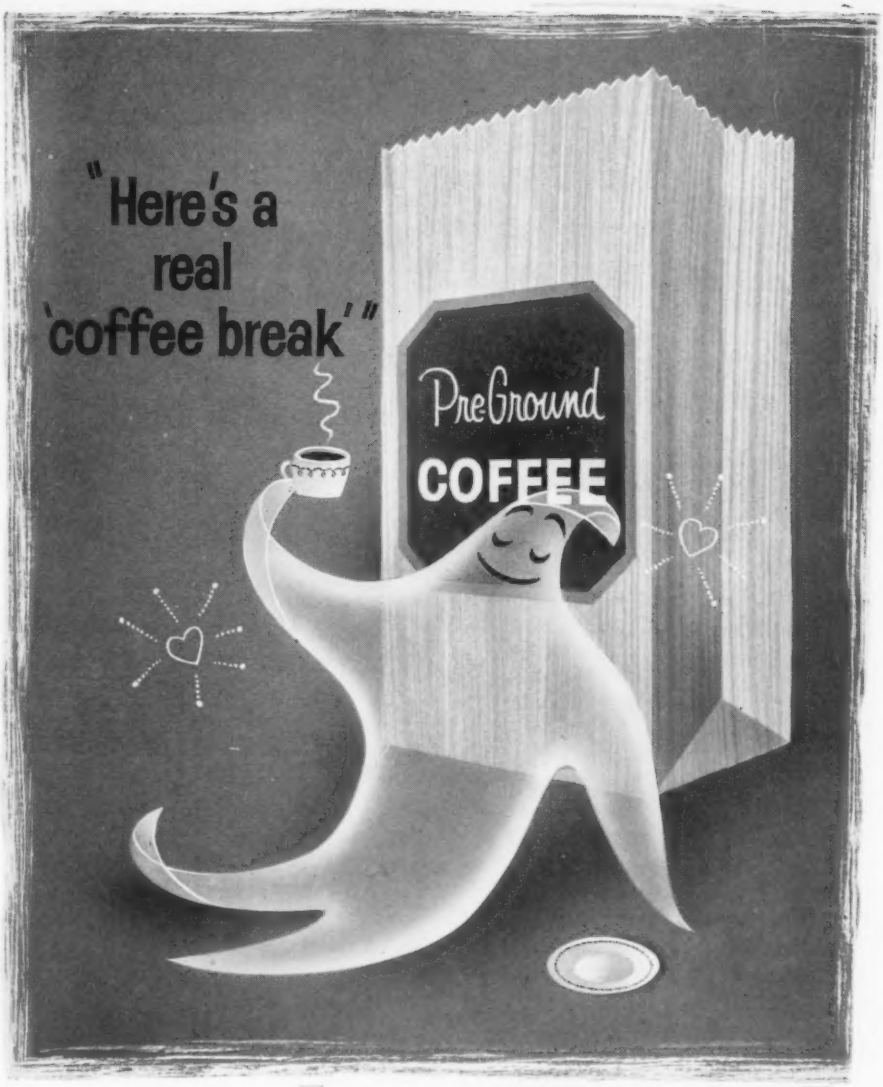
Reader Service Card inside back cover

Our December 1958 issue will carry a cumulative editorial index for the year listing our feature articles by subject, author, and other headings.



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A note from the Publisher

Congratulations to the PMMI and Hanson & Shea for their fine job in organizing the Packaging Machinery and Materials Exposition so that it attracted an audience of top level packaging personnel.

Approximately 10,000 people attended the exposition in Atlantic City in March – about 2,000 more than attended the first show held in Cleveland 18 months ago. Considering the adverse weather reports preceding the show, poor weather during most of the show, and the fact that the AMA-sponsored packaging show is being held in New York City this month – only 60 days later – this was a remarkable turnout.

I heard many favorable and few unfavorable comments on the show – one of the latter being the difficulty in finding out exactly what subjects were being discussed at the Packaging Institute-sponsored technical sessions. Since few show visitors stay for four days, more publicity given these programs in advance would be advantageous to everyone. Also, since few people were in the Exposition Hall when it opened at 9:00 in the morning, perhaps 9:30 or 10:00 would have more appeal.

The next Packaging Machinery and Materials Exposition will be held in New York City in the fall of 1959. I believe a big problem in future shows will be in deciding who, besides machinery manufacturers, can exhibit. Machinery is built to handle various types of packages and packaging materials, so it certainly is logical that these products be shown. However, to make it completely logical, exhibits of packages and packaging materials should show some relationship with the objectives of the show.

A display based on package appearance is out of place in a show dedicated to package performance. Manufacturers of packages and packaging materials who exhibit at future shows will get better results from their exhibits if they dramatize *functional* characteristics and machinability because they then will be talking the language of, and appealing to, the specialized interest of the specific audience this show attracts.

For example, one manufacturer had set up a technical center staffed with men prepared to give performance characteristics of his particular material. Several other material suppliers had packaging machinery in their displays actually running on their materials. Exhibits such as these were of particular interest to the audience this show attracts.

Again, congratulations to PMMI and Hanson & Shea for their March 1958 Show, and best wishes for the success of their future shows.

Angus J. Ray
Publisher

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Letters to PACKAGE engineering

Re: A housewife's views

Gentlemen:

A survey of housewives for their opinion on much of today's packaging might be surprising.

For years I have hoped for real improvement in the packaging of such items as bread, bacon, cheese, tapioca, chocolate bits, rice, raisins, cereals, and many more items.

Cellophane (sic) bread wrap is so thin that after opening, the wrap tears as each piece is removed. Bacon is now packaged and wrapped so you have no idea as to leanness or width of a strip. Brand means nothing there. The housewife has to put chocolate bits and tapioca in a container. Rice, raisin, and cereal boxes where opened cannot be closed. The waxed paper in cereal boxes is effective for about two withdrawals.

It would seem American ingenuity could find a satisfactory way to close a package.

No doubt I sound like a frustrated housewife—I am.

Ruth B. Ritchey (Mrs. N.B.)
Shirley, Indiana

Since "typical" consumers such as Mrs. Ritchey seldom write to magazines such as ours, we can assume the problem is of real interest to her, since she took the trouble to write us at length. While the explanations or answers to many of her queries are readily apparent to most technical and operational packaging specialists, we are passing along her views just as received.

Re: Flavor, odor transfer

Gentlemen:

Mr. Brockington's article published in your January issue is a

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Vulcan delivers steel pails *faster,* SAVES YOU SPACE AND MONEY!

This is a true case history of all the companies who use Vulcan steel shipping containers. Their composite story reads like this: delivery of pails forced them to tie-up excessive funds and space in a big inventory. They switched to Vulcan, and got faster delivery, in all quantities, on a precise and rigidly maintained schedule. Their inventory needs dwindled rapidly, and they had more free cash and manufacturing space. The same thing can happen to you, because Vulcan is an expert authority engaged exclusively ih the manufacture of steel pails and drums, and maintains the largest warehouse stock of these items. This means we can deliver your needs and inventory savings at the same time. May we prove it to you?

NOW! REDUCE STEEL CONTAINER INVENTORY COSTS! MAIL THE COUPON TODAY FOR TEST SAMPLES AND THE NAME OF YOUR VULCAN REPRESENTATIVE!

Hi-Bake protective linings · one to 55 gallon capacities all variations of open or closed heads faster delivery from the largest warehouse stock · from a carton to a carload · brand name decoration · special designs

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VULCAN CONTAINERS INC., Bellwood, Illinois

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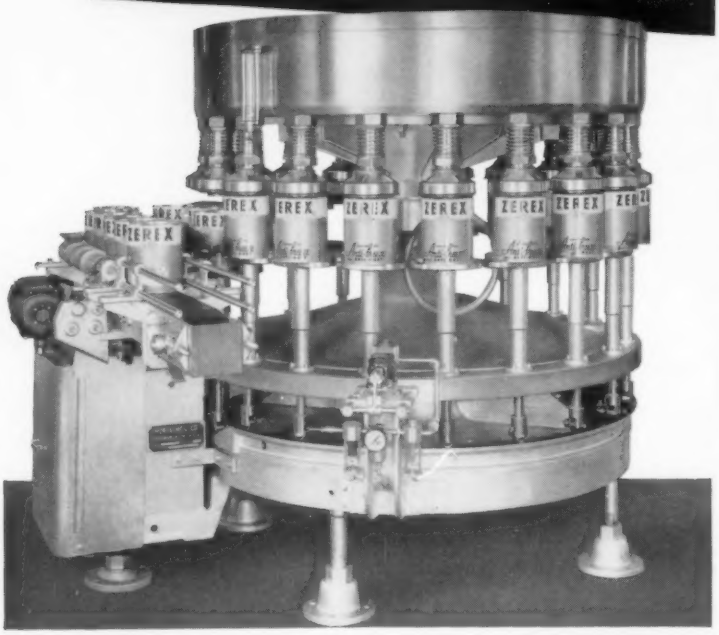

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The filler is without a doubt the most important machine in the line. It alone handles both bulk product and container . . . and *how* it does this very often spells the difference between profit and loss.

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credit to the author and to PACKAGE ENGINEERING. I can use two reprints to good advantage with packaging firms. Do you still have one or two on hand? A copy of the bibliography would be much appreciated.

Dr. C. R. Fellers
University Laboratories
Consultants
Amherst, Massachusetts

We appreciate your interest in Mr. Brockington's challenge and suggestion that packaging people take a new look at problems of flavor and odor transfer. The materials have been sent to you with our compliments.

Re: Receipt of Package Engineering

Gentlemen:

I haven't received a copy of PACKAGE ENGINEERING since your November 1957 issue. Would you kindly look into the matter and see if my name is still entered on your mailing list?

I would like to continue receiving your publication. It is of immense value in keeping me abreast of the latest developments in the field of packaging.

W. J. Kraus
Supervisor, Pharmaceutical Production and Packaging Dept.
Charles Pfizer & Co., Inc.
Brooklyn, New York

We have sent you the copies that you missed and have put your name back on our complimentary list. Probably the reason you were taken off is because we didn't have a request from you to stay on the list. We have been trying to eliminate from our circulation list individuals not interested in our publication. However, you are now reinstated and should receive complimentary copies regularly. We have to re-confirm your desire to stay on our mailing list at 18 - *month intervals. Eighteen months from now we will send you a card and if you want to remain a* PACKAGE ENGINEERING *reader, simply return the card to us.*

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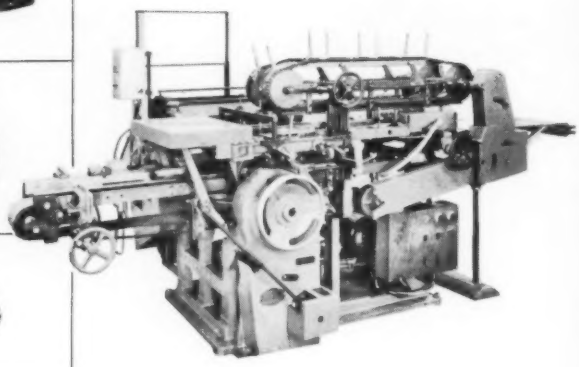

For consistently neat, attractive packages at speeds up to 100 a minute, you need the versatile Package Model FA. One machine will give you top daily output on cartons, trays or specialty items. Size changes require only minutes time, and another roll of wrapping material can be inserted in less than five minutes.

An electric eye mechanism gives you the most accurate registration possible, with an automatic paper stop to control feeding. You get neater wraps, too, because packages pass through the FA in a straight line, and operations are performed without turning.

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compare these features

MATERIALS: FA glues or heat seals. It can handle waxed, sulphite or Kraft paper, cellophane, glassine and reinforced foils.

SIZE RANGE: For Model FA, 2" to 11½" L, 1⅛" to 5⅝" W, ⅛" to 3½" H. Models FA-2, -3 and -4 will handle larger packages.

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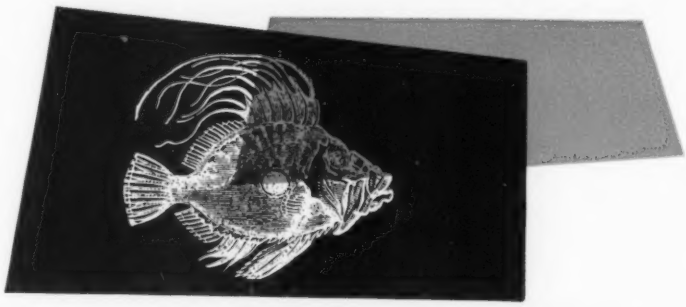

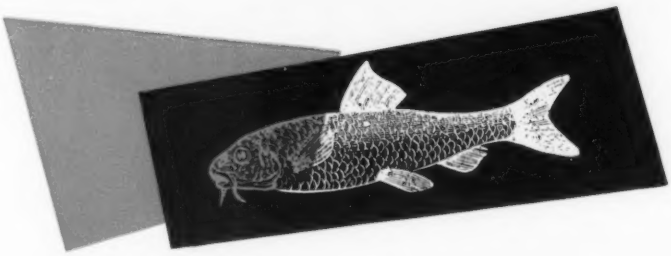

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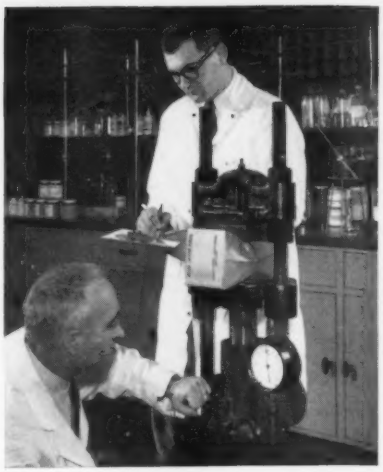
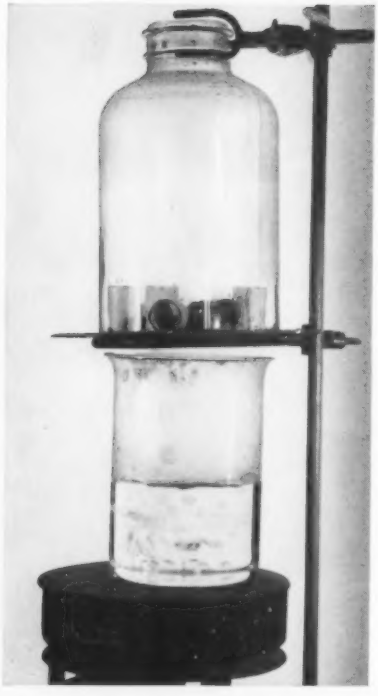


210-pound squeeze! Seban AR-2—case-sealing adhesive—withstands extreme pressure. Compression test proves Seban can take almost any amount of palletizing—more than 200 pounds—and still hold, even when the case breaks down. Choose Seban when great bonding strength is important.

Seban will pass your toughest sealing test



36 minutes in live steam! Seban AR-5—tube-winding adhesive—resists both heat and moisture in sterilization of paper tubes for surgical products above. Steam pours into bell jar without delaminating tubes sealed with Seban—not even after 36 minutes. Choose Seban for great resistance to heat and moisture.

In test after test, Seban proves itself capable of meeting almost every packaging situation. Now this new line of polyvinyl resin packaging adhesives from Armour is ready to help you solve your toughest package-sealing problems.

Seban has been proved superior for CARTONS—WINDOW BOXES—CASES—FOLDING CARTONS—TUBES—BAGS—and others. In every instance Seban helps get increased production and better sealing results.

We urge you to have your own laboratory test Seban. Why take chances on an ordinary adhesive doing an ordinary sealing job when Seban has been proved superior?

If you use one of the following machines, a special grade of Seban will help you utilize your equipment to the fullest efficiency.

ABC
Dacam
Dacamatic
Elliott
Ferguson
Gar-Pak
Globe
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International
Jones
Master
Monitor
Mor-Can-Pak
New Jersey
Peters
Pneumatic Scale
Post
Potdevin
Rockwell
Scandia
Standard-Knapp
Staude

ARMOUR ADHESIVE DIVISION

Armour and Company, 1355 W. 31st Street, Chicago 9, Ill.

120 Broadway
New York 5, N. Y.

Delaware and Spring Garden Streets
Philadelphia 23, Pennsylvania

Meta Lane
Lodi, New Jersey

235 South Hamilton Street
High Point, North Carolina

Fiber tear within 5 seconds!
Seban AR-1—carton-sealing adhesive—produces a fast, strong bond. Seban holds, the paper fiber tears. This speed test can be confirmed on actual packaging machinery. Seban grabs in less than 5 seconds, produces a good bond in 12 seconds and tears paper completely within 17 seconds. Choose Seban for fast developed tack, strong bonds.

MAIL THIS COUPON

Armour Adhesive Division
1355 West 31st Street • Chicago 9, Illinois

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POSITION_____

FIRM_____

CITY_____ STATE_____

SEAL WITH SEBAN FOR SUPERIOR SEALING!

Please send me: PE-5-58

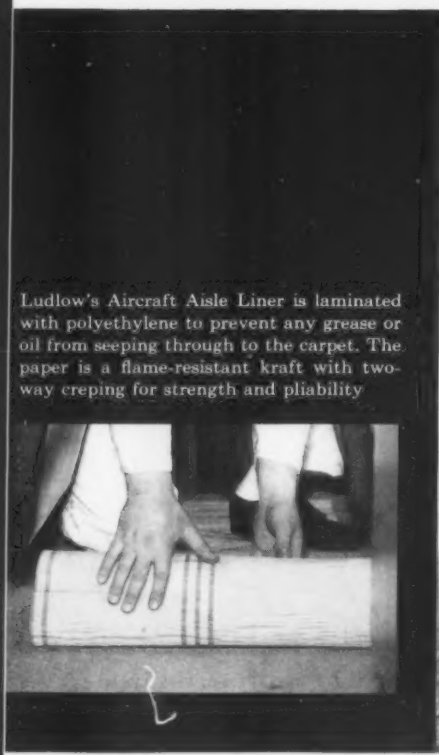
- ☐ New Seban literature
- ☐ A 5 gal. sample at your quantity price. Our volume is_____.

Our application is:

- ☐ Carton sealing
- ☐ Folding cartons
- ☐ Case sealing
- ☐ Tube winding
- ☐ Window boxes
- ☐ Bag sealing

The Ludlow Line Protects Your Products Better

Aisle liner for air liners keeps costs down to earth



Ludlow's Aircraft Aisle Liner is laminated with polyethylene to prevent any grease or oil from seeping through to the carpet. The paper is a flame-resistant kraft with two-way creping for strength and pliability

Air lines throughout the country are enthusiastic about Ludlow's new poly-laminated Aircraft Aisle Liner. This greaseproof, flame-resistant paper protects costly aisle carpeting while maintenance crews are servicing the planes. Some air lines also use Aisle Liner while passengers are boarding during rainy weather. The white cloth liners, previously used, incurred laundering costs — often shrank to impractical sizes. Ludlow's Aisle Liner was developed for the sole purpose of solving this problem. It's so inexpensive it could be discarded after one use. But, it's so durable that each liner is re-used several times.

Aircraft Aisle Liner is typical of Ludlow's job-tailored packaging products. Look to Ludlow for greater protection, lower costs and faster packaging. We'll consider it a privilege to serve you!

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PAPERS, INC.
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a model for every purpose . . . a speed for every need!

NEW! INNERSEALER

RESINA

Automatic innerseal machine for selecting and applying standard innerseals to various types and sizes of tin cans as commonly used in the oil industry.

Capacity: 60-120 per minute

Seals from ⅜" to 1½".

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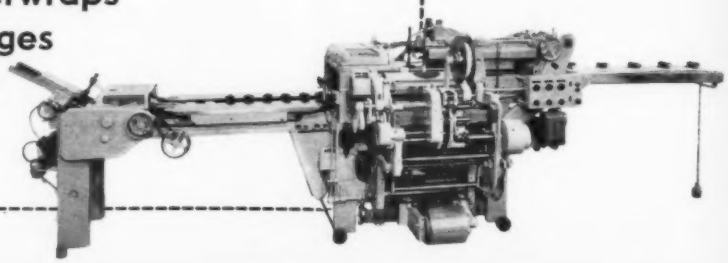
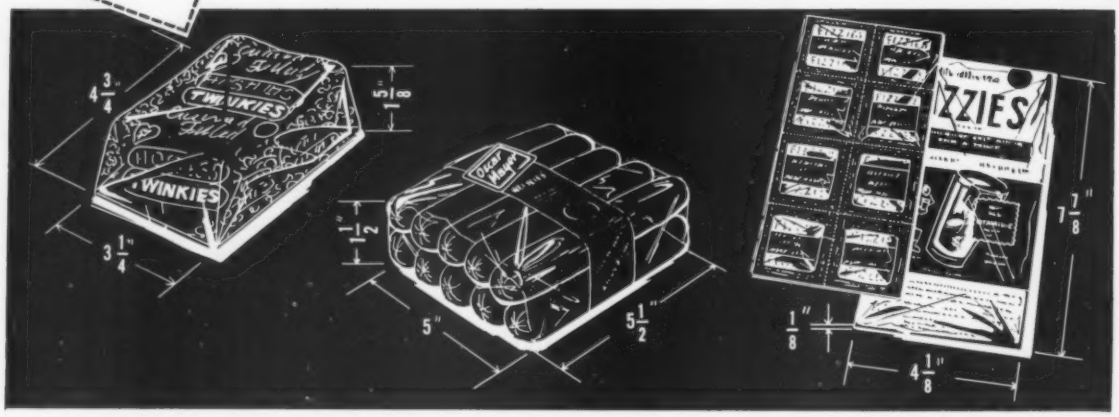
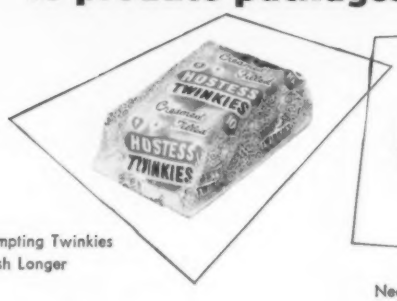
This Battle Creek Packaging Machine Model 43

has handled overwraps within these ranges at speeds up to 70 packages per minute

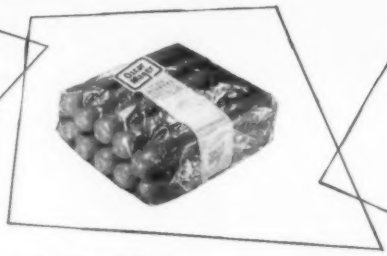




to produce packages like these



Taste Tempting Twinkies Stay Fresh Longer



Neat, Tight Wiener Package Has "See-a-bility" that Means "Saleability"

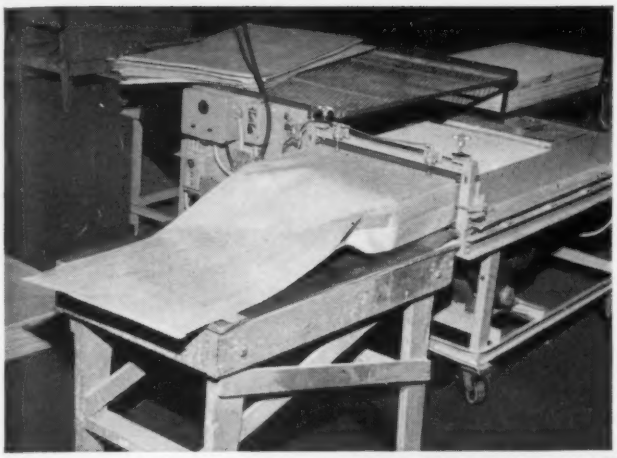
Economical, Efficient Wrapping Sparks FIZZIES Sales and Profits

One of the most versatile packaging machines in the industry today. Battle Creek's *"Continuous Flow"* Model 43 quickly pays for itself . . . in labor savings . . . in increased production and in the variety of products handled. Easily and efficiently wraps such diverse items as clothespins, loose cookies, doughnuts, underwear, paper envelopes and frankfurters . . . either short runs of many different products or long production runs of one item. The Model 43 size range covers a length from 3" to 10", a width of 2" to 4½" and height from ½" to 4" at speeds of 40 to 70 packages per minute. Wrapping material used is heat-sealing cellophane, printed or unprinted with or without identifying top labels, to create a "showcase" package.

Call on Battle Creek Packaging Machines today for quick, complete service on all your packaging problems.

"Continuous Flow" Packaging

BATTLE CREEK
packaging machines, inc.
100 TWELFTH STREET, BATTLE CREEK, MICHIGAN

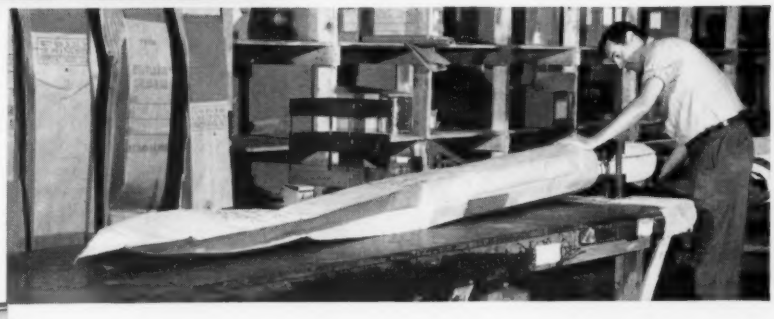


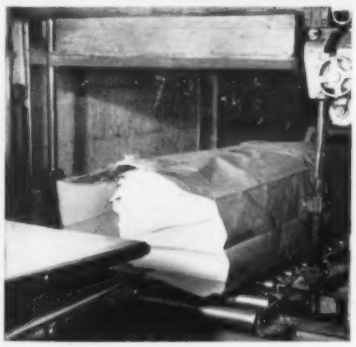
IS YOUR PRODUCT LARGE? . . .

This Bemis-engineered wallboard loader is almost automatic. The operator places the bag on the loader mouth. The machine, taking the stack of wallboard from the conveyor line, does the rest. This replaces an expensive hand-wrapping operation.

. . . ODD-SHAPED

An entirely different shape . . . and different problem . . . is a roll of carpet. However, one operator loads into a Bemis Paper Specialty Bag quickly, efficiently, economically.





AWKWARD TO PACKAGE? . . .

A Bemis Paper Specialty Bag is slipped over the compressor boards of the foam rubber loader. A stack of pads is fed into the loader (upper picture) and belt-propelled through the compressor. As the pads fill the bag, they push it onto a conveyor track (lower picture) . . . a neat, tight, compact package.

Costs are cut . . . packaging is speeded . . . with Bemis Equipment and Bags

Wonderful words: *Costs are cut . . . production is speeded.*

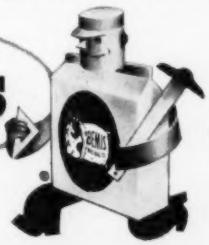
If your product is large, odd-shaped or awkward to package, chances are Bemis Paper Specialty experts can help you so you can report: *Costs cut . . . production speeded.*

The three widely different packaging problems illustrated here show the versatility and ingenuity of Bemis service.

Take the foam rubber pad experience. With a Bemis-engineered loader and Bemis Paper Specialty Bags, *two men now do the job that required four men when the pads were wrapped* . . . and the new packages are much neater, require less storage space and are more easily handled. Also, since the pads are compressed in the package, more pounds (and pads) can be carried in a boxcar.

Write us about your packaging problem. We'll tell you if we can help.

Bemis



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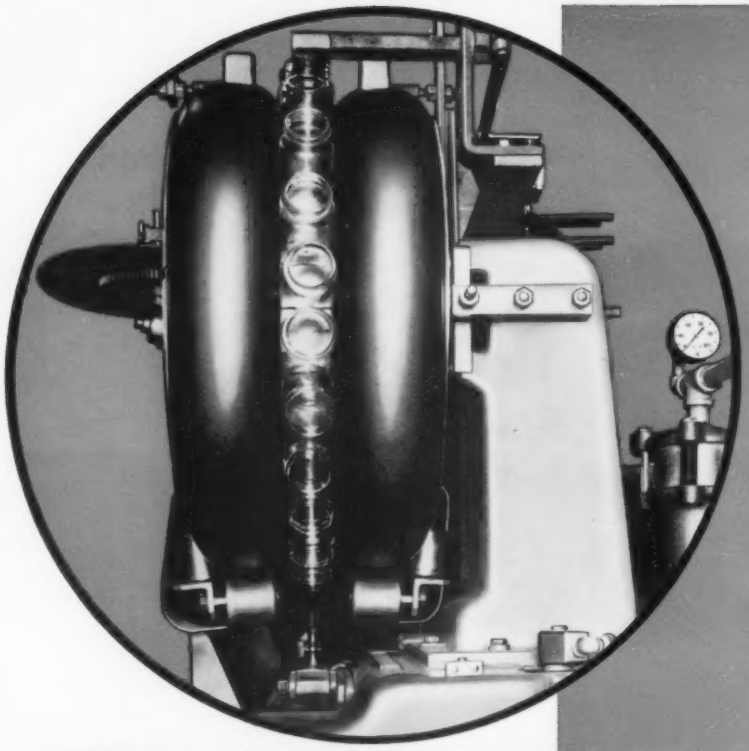


IT'S
MORE *gentle*
A pair of softly resilient air inflated Neoprene tubes hold the containers firmly yet gently, from start to finish.

MORE *speedy*
Continuous operation eliminates transfer time — containers go straight through without interruption of pace.

MORE *flexible*
Because the inflated tubes automatically adjust to fit a range of sizes, change parts are eliminated.

PNEUMACLEAN

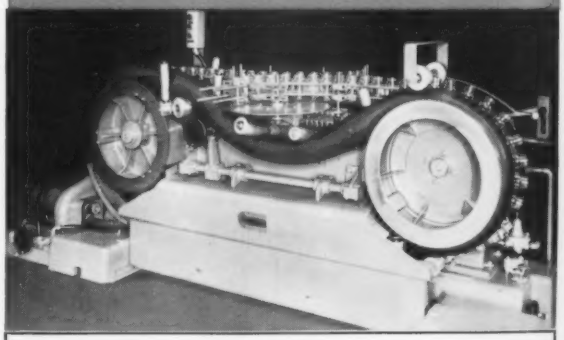
For wide mouth containers and funnel neck bottles

HERE's a cleaner without a single dial, star, helix or screw feed in its entire design. There are no cams, no links, no rocking nor reciprocating motions. No wonder PNEUMA-CLEAN is so far ahead of the field in automatic air cleaning.

The containers ride an endless air cushion that holds them safe and sure, and carries them swiftly through the cleaning operation. They're inverted for the cleaning air blast, righted again and out they go, without even a momentary pause. Speed, up to a fabulous 500 per minute, depending on size.

Bulletin 134 has *all* the information on this smoothest, speediest method of inverted air cleaning. Your copy is waiting — just write for it.

PNEUMATIC SCALE CORP., LTD., 77 Newport Avenue, Quincy 71, Mass. *Also: New York; Chicago; Dallas; San Francisco; Los Angeles; Seattle; Leeds, England.* Subsidiaries: *Delamere & Williams Company, Ltd., Toronto; Carbert Mfg. Co., Inc., Cambridge, Mass.*



Visit Booth of Carbert Mfg. Co., Inc. *AMA National Packaging Exposition, New York Coliseum, May 26-30. Bank-Seal Model 60 Plastic Tube Filler and Sealer and Polyethylene Bag Sealing Machine will be on demonstration. A subsidiary of Pneumatic, Carbert will occupy space numbers 200 and 201.*

★PNEUMATIC

Packaging and Bottling Equipment

For more information circle No. 217 on Reader Service Card

For more information circle No. 218 on Card

GAYLORD TRIMS
YOUR PACKAGING COSTS

Gaylord's approach to packaging doesn't stop with the corrugated box itself. We take a fresh look at your entire packing and handling cost picture, then tailor a program to your exact measure.

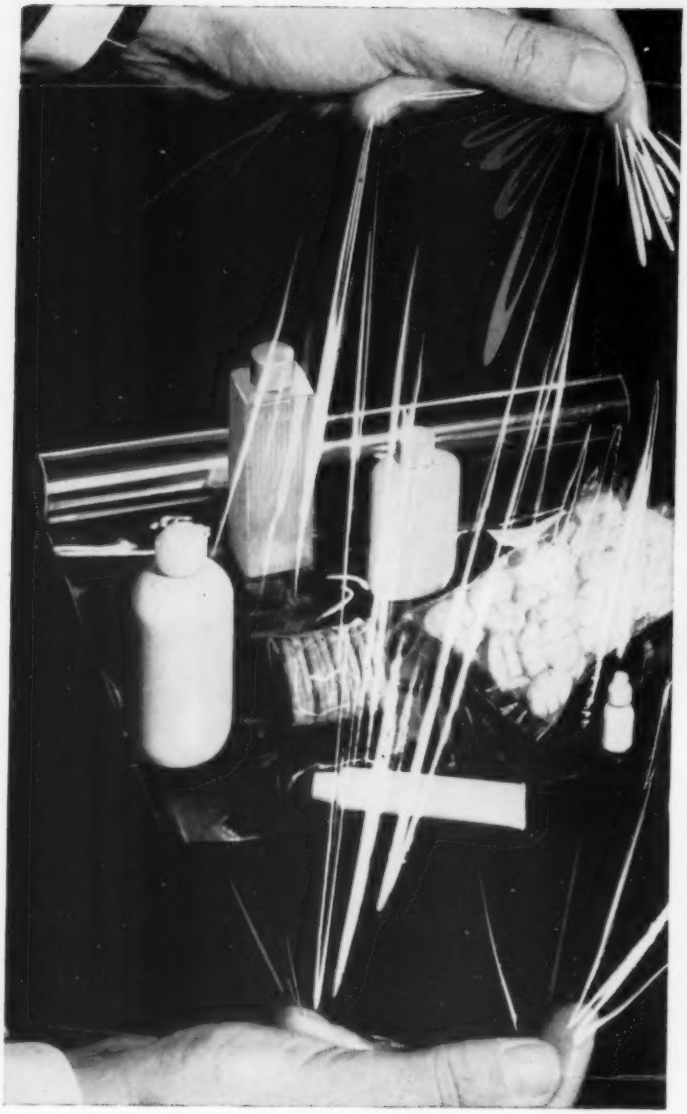
Regular cartons in big volume . . . engineered packaging . . . your nearby Gaylord man knows both. And he is cost-conscious either way.

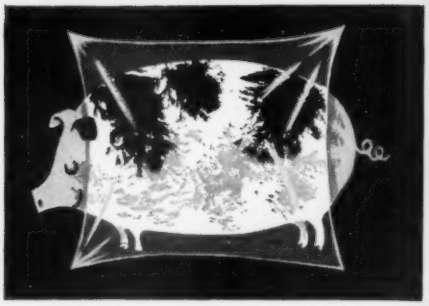
GAYLORD
CONTAINER CORPORATION

Gaylord Boxes

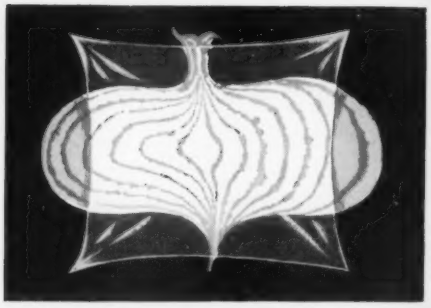
HEADQUARTERS, ST. LOUIS
PLANTS COAST TO COAST

DIVISION OF **Crown Zellerbach Corporation**

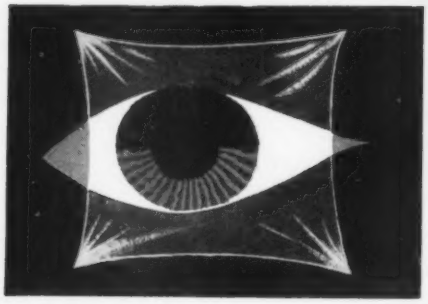




Improved resistance to oils, grease, chemicals



Reduced gas permeability



Improved clarity

Dramatic improvement for polyethylene packaging with saran resins

Saran is the synonym for protective packaging! And saran resins will coat your polyethylene materials with this added protection . . . and save you time and money in the coating operation.

A thin coating of saran resins reduces gas permeability and improves clarity. It adds outstanding resistance to oils, greases, acids and many organic liquids and vapors. It helps polyethylene meet the needs of a wide variety of new applications.

But there's more to coating with saran resins coating than product benefits. They are adaptable to commonly used equipment. A new saran resin is soluble in acetone, releasing solvent at lower temperature. Drying requirements are lowered . . . coating cycle is speeded up . . . costs are less.

For other packaging films, for paper, too . . . it will pay you to get the technical data on saran resins from Dow. Write today to THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department 57-1879A-1.

YOU CAN DEPEND ON DOW

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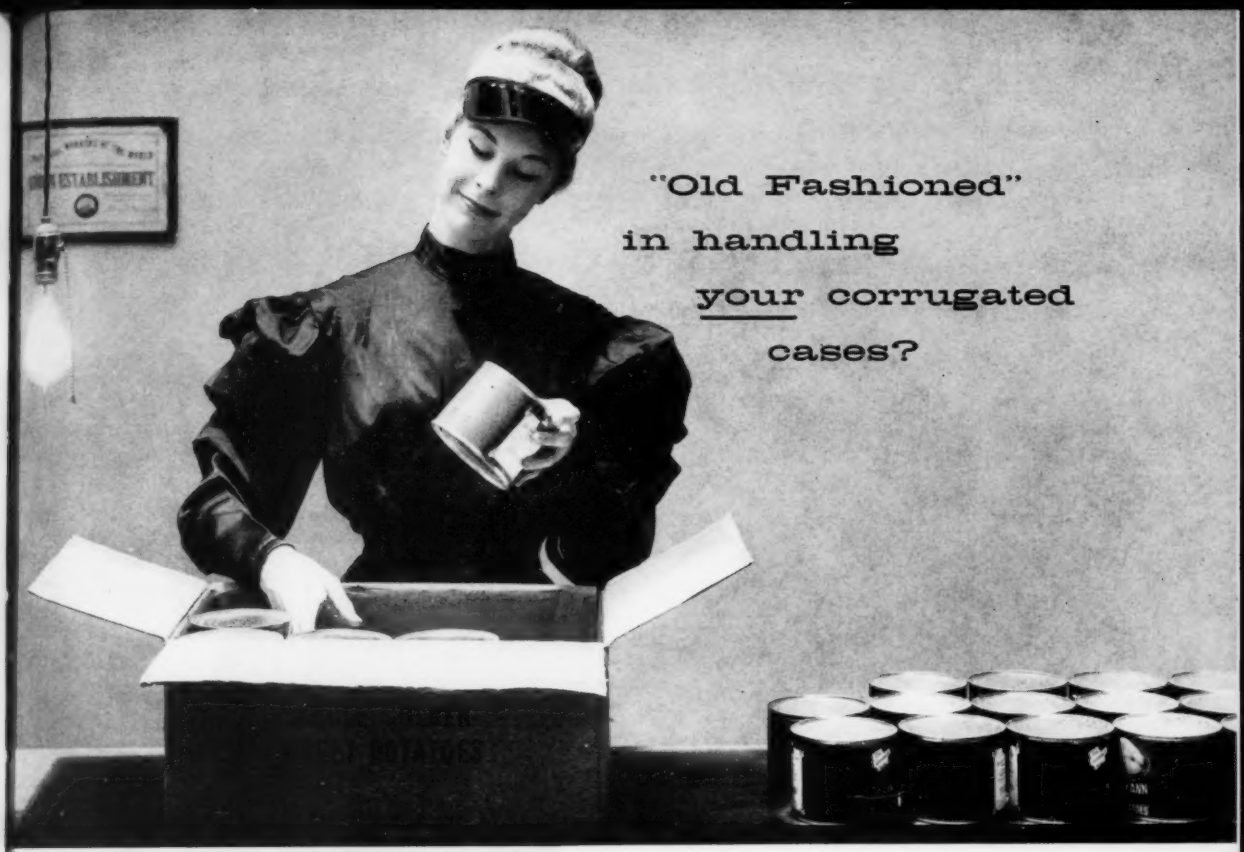

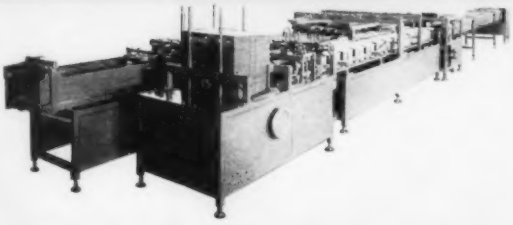

Packomatic

T.M. Reg. U. S. Pat. Off.

equipment feeds, forms, positions, loads, seals, and imprints shipping containers automatically

PACKOMATIC GALLON-CAN CASE LOADER

Packomatics high-speed, continuous-motion case forming, feeding, loading and sealing machine, shown above, oiled the way at the Esso Standard Oil Company plant for faster fully-automatic casing of gallon cans. This is the only machine on the market designed for cost-reducing end-loading style corrugated shipping containers. Custom-Engineered to accomodate cans from the 12 oz. size to the 5-qt. Imperial gallon size, for an almost endless variety of products—from foods, juices and beer to paint, chemicals and cleansers.

J. L. FERGUSON CO. Joliet 1, Ill.

New York, Chicago, Cleveland, Boston, Tampa, Baltimore, Portland, Denver, Los Angeles, San Francisco, Seattle, New Orleans, Louisville, Kansas City and All Principal Canadian Cities.

PACKOMATIC machines include the Bale Sealer — Case Sealers — Opener-Loaders — Case Imprinters — Telescoping Volumetric Filler — Packer-Gluers. Units available, semi-automatic or fully-automatic depending on your needs.

Just stack the magazines with "knocked-down" containers. The rest is automatic. With Packomatic Custom-Engineered equipment, containers are fed out, formed and positioned, end-loaded with cartons or cans, sealed and imprinted 4-sides (serial numbered, if desired) ready for shipment. Packomatics do the whole job—or any part of it. And how they pay off in any plant! End-loaded cases require up to 28% less board. Labor costs shrink dramatically and your packaging line keeps pace with your production line. Your Packomatic line can grow as you grow, too. Start now with a case opener and loader, or case sealer, or imprinter—build it unit by unit into a complete system.

Six 5-qt. cans or gallon cans in 20⅛" x 13⅜" x 9 13/16" case and 20¼" x 13¾" x 8¼" case

Twelve 46 oz. cans in 21" x 13" x 7⅛" case

Twenty-four cartons in 12½" x 10⅝" x 8½" case

Eighteen 7 & 8 oz. cartons in 20" x 14⅞" x 8⅛" case

Sixty cigarette cartons King Size: 17⅞" x 11½" x 22" Regular: 14 13/16" x 11½" x 22"

TYPICAL CASE LOADING PATTERNS FOR CANS AND CARTONS

Twenty-four 12 oz. cans in 16⅛" x 10 9/16" x 5 5/16" case

Six No. 10 cans in 22 1/16" x 17⅜" x 7⅛" case

Thirty 1 lb. cartons in 16½" x 10 5/16" x 7¼" case

Twenty-four cartons in 19½" x 10⅞" x 7" case

Forty-eight cartons in 22¾" x 23½" x 15⅛" case

Selecting the right container—the vital step in modern marketing—is your product insurance ■ Why not adopt the policy of many leading manufacturers—select Sheffield Process Tubes ■ Hundreds of America's best selling products—medicinal, drug and cosmetic, industrial and household—are selling better because they are properly contained in the modern, convenient safety of smart looking Sheffield collapsible metal tubes ■ You pay no premium for Sheffield's vast experience (more than a century) and complete facilities for tube packaging ■ Without obligation, discuss every phase of your packaging problem with a packaging expert—the man from Sheffield ■ Write for samples, catalog ■ THE SHEFFIELD TUBE CORP. ■ Home office: New London, Conn., Sales offices: New York, Chicago, Los Angeles

Sheffield Tubes

FOR MANY PRODUCTS

THERE IS ONLY ONE

PROPER CONTAINER

STOP PRODUCT WASTE—USE METAL TUBES!

For more information circle No. 221 on Reader Service Card

C. C. Sutton has a B.S. degree in chemistry from the University of Delaware and an M.S. degree in chemical engineering from Cornell University. He went directly to work for General Foods Corporation in Chemical Engineering. After a period in the physical chemistry section, he assumed his present position of assistant laboratory director for the packaging laboratory in the General Foods Research Center. He is a member of the Institute of Food Technologists and is corporate representative in Packaging Institute. He is chairman of the newly formed ASTM Committee F-2 on flexible barriers.

Evaluating the performance of a packaging line

By C. C. Sutton,
Assistant Laboratory Director,
Packaging Laboratory,
Research Center,
General Foods Corporation,
Tarrytown, New York

What department must stand the cost of working out the bugs from a new production line, a new package, or both? In some companies it's wholly a Production expense. In General Foods, however, the cost of getting a line up to satisfactory production is chargeable to the development group. That being the case, there must be a method of deciding when the line is doing well enough for Production to take over. It's not as easy as it might sound.

In General Foods we are keenly aware that the prime function of the production departments is to produce, not to experiment; and conversely the prime function of the development groups is to experiment, not to produce. Translated into practice this means that the job of putting a new type package or type of machinery into operation is primarily the responsibility of the development groups.

All of the many experiments, tests, troubles, breakdowns, and elimination of "bugs" on a new line or package are therefore the responsibility of development until the line or package is performing in a manner such that the Production Department is willing to accept responsibility for its operation. *Actual operation of the line may be handled by much the same personnel both before and after the transfer.* Where possible, all of the expenses attendant on getting the operation up to an acceptable standard will be charged to development.

On its part, Production expects to take over a going operation or package that is producing satisfactorily and will not be charged with expenses that should properly belong to development. The point at which the new package or line ceases to be a responsibility of the development groups depends on what is meant by "producing satisfactorily" in the foregoing sense.

For it is well known that nothing in the factory ever produces at 100 per cent of perfection. Therefore, it is desirable to make an agreement with Production, long in advance of starting the new package, or line, that will state in definite numerical terms just what reasonable degree of perfection, and for what length of time it must be attained, before Production will take over.

Systematic Evaluation

All the foregoing makes it highly desirable for us in the development groups to use a systematic method of evaluating the performance of a line of machinery in addition to evaluating the performance of the package itself. The two evaluations are so closely related that they should be regarded as inseparable because an unsatisfactory line performance may be caused by either machine defects or maladjustments, or by package defects (especially dimensional errors), or by both.

The wisdom of placing the complete responsibility on development groups until the performance is satisfactory is readily apparent. It also serves another good purpose: The analysis of the costs of attaining satisfactory performance often pinpoints the proper areas for further profitable research or mechanical improvements. (*Turn page*)

RUN NO._____

DATE_____

FINISHED GOODS AUDIT

End of Line Inspector_____

Sampling Plan No._____

Case No.	Time	Net Wt. Limit		Carton						Overwrap						Product Segregated
		Under	Over	TOP		BOTTOM		SIDE SEAL		TOP		BOTTOM		SIDE SEAL		
				Unsealed	Poor Seal	Unsealed	Poor Seal	Unsealed	Poor Seal	Unsealed	Poor Seal	Unsealed	Poor Seal	Unsealed	Poor Seal	

Fig. 1. Form for reporting line-inspected finished goods when packaging line-performance is being evaluated.

We regard our methods of evaluation of line performance as a commonsense outgrowth of our efforts to charge experimental costs of the expense of trial and error to development.

How We Do It

Since a packaging line exists for the primary purpose of producing acceptable packages at a minimum cost, the two factors or groups of factors with which we are normally concerned are: (a) Those which have to do with package quality; and (b) those which have to do with machine performance and efficiency.

Before we can really evaluate the performance of a packaging line, we must first establish the performance requirements of the package itself. To do this properly, we must know something about the desired shelf life of the package so that we can design it to maintain the finished product in acceptable condition until it reaches the consumer. This acceptable condition must be possible for essentially all the areas of the country and all all distribution channels we use.

Thus, our package must protect its product through a summer in the Gulf Coast area. Sales experience and study of products picked up from store shelves in that area will establish the maximum probable shelf time for the product in question. If it happens to be a new product that we are considering, we can reason by analogy from the evidence of similar products.

With this information we can store packages of our products in our toughest environmental areas, usually the Gulf Coast, and establish a package type that will do the job if the package is properly made. Package specifications are then written.

Study Initial Defects

Whenever possible, packages for such testing are made on prototype machines or on equipment of the design that we expect to use (if it is an existing type of packaging machinery). After forming the packages, the types of package defects likely to be encountered are noted, such as: Faulty carton seals, inadequate adhesive, faulty liner or overwrap seals, faulty overwrap registration, crushing of the carton, net weight variations and, in some cases, product segregation resulting from vibration or feed-hopper design that is less than ideal.

For each potential defect we establish a standard that will produce a satisfactory performance. For example, on a carton seal there must be a definitely stated percentage of the glue-sealed area that will give a fibre-tear when peeled open. Or, if the product is relatively finely divided, the carton must be sift-proof. The requirements are, of course, more stringent for fine materials than for a product that comes in large particles, or for a carton that is to be tight-wrapped or lined. In the case of a pouch pack, we establish the maximum permissible gas leakage by test.

Setting Tolerances

The product development groups and General Foods Kitchens establish the maximum permissible tolerance in net weights and product segregation. In deciding these points they are frequently guided by the performance of the product when it is used. For example, some products requiring a fixed amount of liquid to be added in their home preparation are more sensitive than others to variations in the percentage of each component present and to variations in the total weight of

RUN NO._____

DATE_____

REJECT ANALYSIS

End of Line Inspector_____

Time	Net Wt. Limit		Carton						Overwrap					
	Under	Over	TOP		BOTTOM		SIDE SEAL		TOP		BOTTOM		SIDE SEAL	
			Unsealed	Poor Seal	Unsealed	Poor Seal	Unsealed	Poor Seal	Unsealed	Poor Seal	Unsealed	Poor Seal	Unsealed	Poor Seal

Fig. 2. Form for reporting the analysis of packages rejected by line-inspection during experimental line-operation.

dry product in the recipe.

Tolerances to substandard package appearance are set in cooperation with the merchandising groups. These pertain primarily to such things as wrappers being out of register with the package face, or scuffing of labels. Having set the minimum standards for each of these items, we can then decide upon the frequency of each defect that can be tolerated.

Obviously, this depends to some extent on how the minimum standards are set and on the importance of the defect itself. For example, in a product which is not very sensitive to variation in consumer formulation, we can permit a higher frequency or a wider tolerance in some components than we can on others.

Line's Minimum Standards

Having arrived at the minimum standards and the maximum per cent of defects that can be tolerated, we then have a minimum base line of performance. This minimum must be attained before the line can be considered a satisfactory production line so far as quality is concerned. Naturally, a continuous improvement toward the goal of perfection can be measured by the decreasing percentage of defective packages or by the increase of the minimum quality standard toward the optimum.

At this point we are now ready to consider the cost of operating the packaging line. It is not the purpose of this discussion to get into cost-accounting procedures but the line speed, line efficiency, and the number of rejected packages are the three principal factors affecting the performance of the packaging line so far as cost is concerned. It is customary to begin operating a line on an experimental basis at a speed that seems reasonable to the designers. Ideally, this speed is determined by exploratory runs on the equipment. The speed is then temporarily "frozen" and experimental operation of the line is begun.

Inspecting The Results

As soon as packages start coming off the line, the inspection of the finished packages for all the defects mentioned earlier is begun. Sub-standard packages are rejected and the rest are accumulated, usually in cases. If the proportion of rejects is high, the line is immediately stopped and adjustments are made. After a period of operation, the finished goods are re-examined extensively to audit the inspection and rejection procedure. (See Fig. 1) This is done to insure ourselves that they are adequate to maintain an acceptable quality-level in the finished goods.

For a given test run we then have three major classifications of data expressed as percentages:

(1) The overall efficiency, that is the total number of packages of acceptable quality produced, expressed as a percentage of the number of packages that would have been produced if the machines had been operating perfectly 100 per cent of the time covered by the test run.

(2) The per cent of rejects, that is the number of rejected packages expressed as a percentage of the total number of packages that would have been produced if the machine had been operating ideally or perfectly 100 per cent of the time.

(3) The outgoing quality level, that is the number of acceptable packages as determined by audit, expressed as a percentage of the number of packages produced after

the rejection station.

Rejects Are Analyzed

The rejects are analyzed for the number of each type of defect (Fig. 2). Downtime on the machine is identified as to cause (some downtime, for example for the purpose of changing rolls of wrapping paper, may be inevitable) (See Fig. 3).

With this information we will: (1) Either accept or reject the finished packaged goods after end-of-the-line inspection on the basis of our audit; or (2) we will learn ways in which we can improve end of-the-line inspection so that subsequent runs are less likely to be rejected for substandard quality when they are audited. Finally, by analysis of the total number of defects of each type and analysis of the causes of downtime, we have information upon which to base machine adjustments for the next run. This cycle is repeated until our audit regularly shows acceptable quality of production, thus indictating that end-of-the-line inspection itself is adequate.

Experimental operation is continued from here on, the primary objective being to minimize the number of rejects, even at the expense of shutting down the line or lowering the efficiency.

Boost Line Efficiency

In the final stage of development we are concerned with increasing the line efficiency. As stated previously, it is desirable to have an advance agreement with the Pro-

(*Continued on Page 79*)

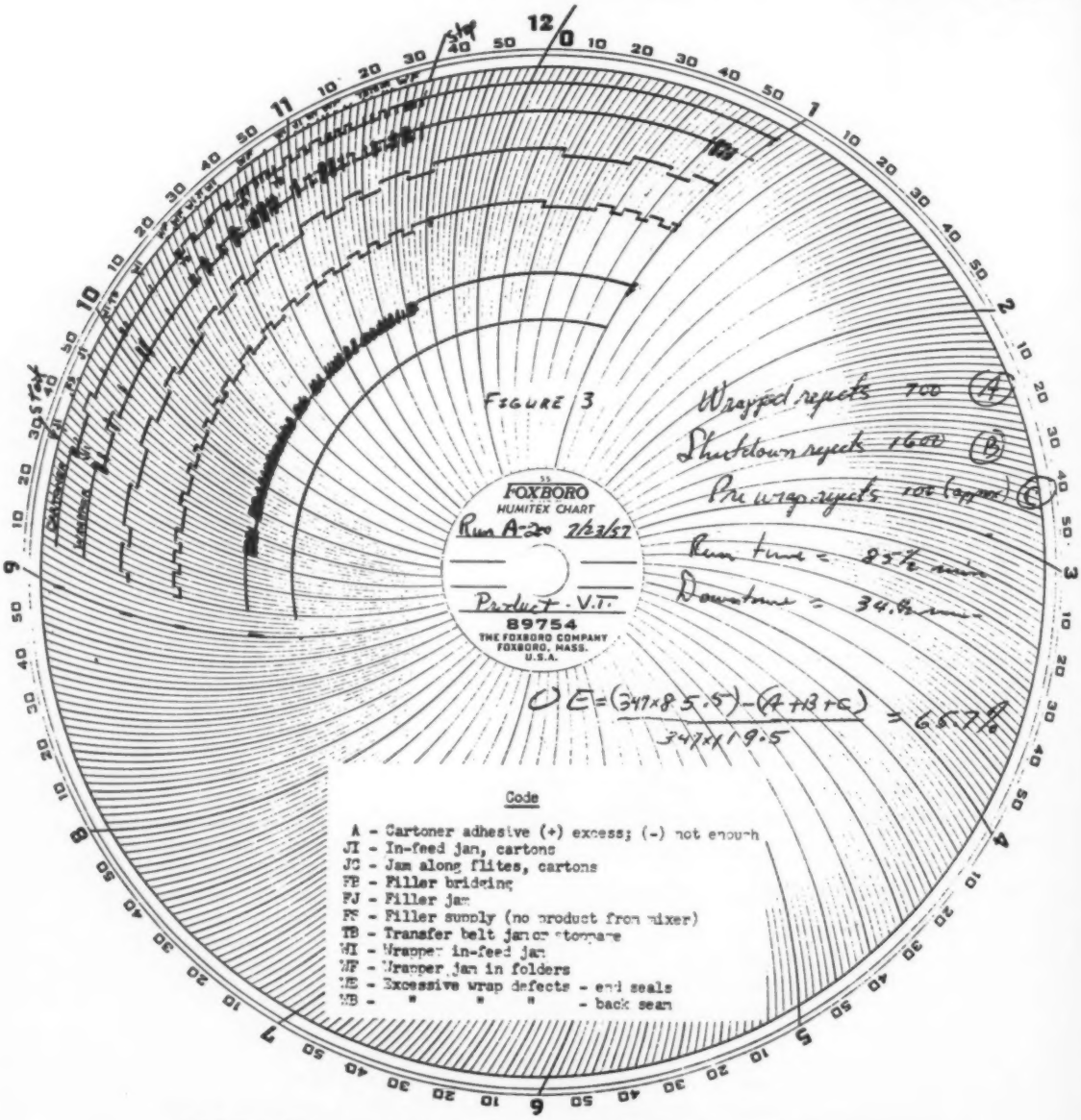
FIGURE 3
FOXBORO
HUMITEX CHART
Run A-20 2/23/57
Product V.T.
89754
THE FOXBORO COMPANY
FOXBORO, MASS.
U.S.A.
Wrapped rejects 700 (A)
Shutdown rejects 1600 (B)
Pre wrap rejects 100 (approx) (C)
Run time = 85% min
Downtime = 34.6% min
Code
A - Cartoner adhesive (+) excess; (-) not enough
JI - In-feed jam, cartons
JC - Jam along flites, cartons
FB - Filler bridging
FJ - Filler jam
FS - Filler supply (no product from mixer)
TB - Transfer belt jam or stoppage
WI - Wrapper in-feed jam
WF - Wrapper jam in folders
WE - Excessive wrap defects - end seals
WB - " " " - back seam

Fig. 3. Every line stoppage must be analyzed for causes, and these must be recorded during the evaluation period.

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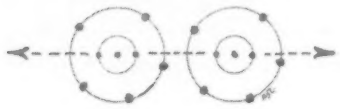
Morris J. Root has been associated with G. Barr & Company for four and a half years. He was previously assistant technical director of Rayette, Inc., St. Paul, having been associated with that firm ten years. He holds bachelor's and master's degrees in chemical engineering from the University of Minnesota. His list of prepared papers includes material presented before such groups as Society of Cosmetic Chemists, research and development section of American Drug Manufacturers Association, Chemical Specialties Manufacturers Association, and scientific section of Toilet Goods Association, Inc.



Nitrogen: A propellant for pressurized packages

By Morris J. Root,
Technical Director,
G. Barr & Company,
Chicago

Although the idea of using compressed gases or air to push liquids from a container goes back almost a century, it has been only recently that the use of inert gases as propellants for pressurizing a container has been made practical. In his approach to the use of nitrogen, Mr. Root explains the properties of this gas which make it ideal for this purpose. He discusses the various characteristics of different types of products, and how gas solubility in the product affects the resulting form of the product upon being dispensed from a pressurized package. He reviews various types of containers and valves available for use with gas, and regulations concerning the amount of pressure a container must withstand. By use of laws of physics, Mr. Root demonstrates the method by which to determine the amount of nitrogen required for a given headspace. Also, he stresses the importance of proper headspace for a given product to allow dispensing a maximum amount of the product. His outlook and predictions of the use of nitrogen as a propellant in pressurized packaging are optimistic.

For some time now certain food products have been blanketed either during processing or in the packaging operation with inert gases such as nitrogen or carbon dioxide for prevention of oxidation or preservation. A recent development, however, is the use of inert gases for pressurizing a container for propellant purposes. Thus, a package can be made for food, toilet goods, paints, and many types of industrial products that is self-dispensing. In this manner, the product can be dispensed as a spray, a foam, or a liquid. It has already been announced that three of the largest toothpaste manufacturers are readying their products for marketing in this manner.

Nitrogen was first recognized by Daniel Rutherford in 1772. At about the same time, A. L. Lavoisier isolated nitrogen and, because of its inertness, termed it "azote" (lifeless). Present activity with nitrogen packaging can be termed anything except lifeless.

Patents – Prior Art

The idea of using compressed gases or air to push liquids out of containers goes back for quite a few years. As early as 1862, a patent was issued to John N. Lynde (U. S. 34,894) for a valve for dispensing a pressurized liquid from a bottle. This valve, complete with a dip tube, although of crude design, can be considered as a forerunner of present-day pressure valves.

In 1911, Guy L. Kennedy patented a tap for dispensing liquid under pressure. His claim stated, "A tap for dispensing liquids under pressure, comprising a valve casing, a valve therein, a spring normally closing said valve, a tube extending laterally from said valve casing . . ." Certainly he had all the functioning requirements of a present-day nitrogen package.

M. C. Reinicke, in his U. S. Patent 2,120,297, dated June 14, 1938, describes a device for discharging and dispensing products such as whipped cream, batters of all kinds, custards, cheeses, etc. He states, "The hermetically-confined contents of the container chamber are to be permeated by, and charged with, a suitable gas and the gas-charged material is then to be maintained under a suitable, desired pressure of its contained gas and of the gas accumulated in the free space above the level of such material in the top portion of the container chamber.

Gas Under Pressure

"The gas-charged material is maintained under gas pressure until such time as it is desired for use, either all of it or in any smaller desired amounts from time to time. When the described service valve is opened, the gas-charged material will be delivered through the described service duct or dispensing conduit by reason of the expansion of the gas under pressure contained within such material and *by the gas under pressure in the free space above such material.*"

Gas not soluble, remains. It is, of course, obvious that if the gas is not soluble in the material, the gas will all be in the free space above the material. Since Reinicke was interested in "discharging the expanded food product from the device in a frothlike form," he used gases which were soluble in the material, such as nitrous oxide (N_2O) and carbon dioxide (CO_2). He elaborates, "Different kinds of gas can be utilized in carrying out my invention depending upon special requirements in different instances.

"In most instances, nitrous oxide gas (N_2O) is suitable. In some cases, carbon dioxide gas (CO_2) can be used. Atmospheric air is commonly unusable, since it will not be absorbed by the materials which are desired to be charged." By *unusable*, it is obvious that he means insofar as pushing out the product in a frothlike form, since any gas under pressure in the free space above the material will push it out. All of Reinicke's claims are drawn to "a device adapted for producing an aerated, expanded food product."

Getz, in U. S. Patent 2,294,172, also relates to aerated food products. His claims are drawn to the process of producing an aerated product by causing an edible fat-containing liquid to absorb an inert, non-acid-forming gas and suddenly releasing the pressure. Viscous foods such as ice cream mixes, mayonnaise, salad dressing, tomato catsup, and beaten white of egg, are specifically mentioned.

Distinctions Reviewed

Pyenson's U. S. Patent 2,723,200, is a method for packaging viscous food products. The chief point of difference between Pyenson's method and that of Reinicke and Getz is that his object is merely to *dispense* a viscous food product, not aerate it. Consequently, a non-soluble gas, nitrogen, is used. Pyenson points this out very well in his specification.

"The distinction between the method herein taught and that utilized in aerated cream is most obvious. In the latter procedures, it is requisite that the gases therein used, which are nitrous oxide and carbon dioxide, be dissolved in the cream prior to release of the gas pressure, and severe agitation is utilized to assist the dissolution of the gas."

No dissolution. "In the present method, there is no dissolution or reaction whatever between the propellant and the food preparation. The gas remains as a physically separate propellant charge and the food is dispensed without need for such agitation." It can be pointed out that agitation is merely an aid to solution and that if the gas is not soluble in the material, no amount of agitation will solubilize it.

Pyenson's claim follows: "The method of protectively packaging viscous products to be dispensed under pressure *without aeration*, comprising the steps of partially filling such product into a gas pressure container *having a valve, evacuating* the air from the unfilled portion of the container, filling the void with nitrogen gas under pressure, and *closing such valve.*"

Not new development. It would appear from the prior art that the idea of a pressurized package is far from new. The development of containers, valves, and production methods for aerosols has made pressure packages now practical. Once suitable valves and containers were available, it became a simple procedure to fill the container with a product, seal it with a valve, charge it with a gas, and have a self-dispensing package.

If the product is viscous, this package is all the more suitable. If the charging gas is soluble in the product, it comes out frothy since the gas is released at reduced pressure. If the gas is not soluble in the product, it is merely pushed out and the product appears just as it would if coming out of a conventional package.

Products – Characteristics

Foam—aerated. The first pressurized product that utilized non-condensible gases was whipped cream which is now so widely sold and used. To make an aerated product, it is necessary that the gas have some solubility in the product. In the case of whipped cream, it was found that nitrous oxide had sufficient solubility in the butterfat. A mixture of nitrous oxide and carbon dioxide was later adopted as it had exactly the right characteristics. Recently, nitrogen alone has been used in some whipped-cream products.

Liquid—Non-aerated. By the use of a gas which is insoluble in the product, it can be dispensed in non-aerated form. For many products, a foam is not a desirable form for dispensing and usage. A recently-introduced food product which is pressurized with nitrogen is chocolate syrup. The ease of use and convenience of this product in a pressurized container is beyond question.

Spray. Although there is already one spray food product, barbecue sauce, being marketed in a container pressurized with nitrous oxide and carbon dioxide, there is one drawback with spray products. Since the pressure in the can drops as the gas expands in the space which was taken up by the expelled product, the spray characteristics will change. When the product is first used, the pressure will be high and the spray fine, but as the container is emptied, the pressure will drop and the spray will become coarser. Although for barbecue sauce this is not of importance, for other types of products

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Thilco Reps Contribute Packaging "Know-How" to AMA Show

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H. O. (Red) Peters — Vice President and Manager of the Midwest Sales Division in Chicago, "Red" nourishes an exceptionally broad experience in packaging paper for the food field. His insatiable knowledge for glassines, greaseproofs and pouch papers has been a most important factor in the constant refinement and development of these THILCO grades for the food industry.

Dr. M. L. (Martin) Downs — Thilmany's Technical Director, is a highly recognized authority on functional packaging papers throughout the paper industry. A graduate of the famed Institute of Paper Chemistry, he joined Thilmany immediately after acquiring his doctor's degree. Martin will be available at Thilmany's exhibit throughout the show to help solve individual packaging problems.

R. W. (Dick) Douglas — Dick heads up the Waxed and Polyethylene Papers Division of Thilmany and in his position has played a key role in the development of these protective papers as pouch and wrapping papers, especially adaptable for automatic packaging machines. Dick carries out the liaison role between machine manufacturers and the mill and will be on hand to discuss THILCO Waxed and Poly grades for specific needs.

J. J. (Jim) Fitzpatrick — Recently placed in charge of Thilmany's new Boston Sales Office located at 139 S. Main Street, Haverhill, Mass., Jim has "been through the mill" and is in position to contribute expert advice on all of the THILCO line papers. Decorated and identifying functional packaging papers for New England's varied industries are his specialty.

J. T. (Jerry) Thomas — Manager of the Central Sales Division, Detroit. Jerry is particularly well known throughout the Detroit-Cleveland-Pittsburgh area for his broad knowledge and experience on THILCO protective papers for steel mills, the automotive field and other heavy industry manufacturers. Jerry also knows his way around with all THILCO papers, particularly in the industrial specialty and polyethylene fields.

L. R. (Bob) Graef — Division Manager of Thilco's Northeast Sales Division in New York. With Thilmany since 1935, Bob knows the mill inside and out, but has devoted most of his efforts and experience to Ream Wrappers; Box Cover Papers; Decorated Trade-marked papers for Textile industries, Department stores and Specialty shops; and to the packaging of Sensitized Papers.

V. G. (Verne) Haag — General Sales Manager has "grown up" through most of Thilmany's manufacturing divisions since 1949 after broad paper experience with two of the industry's leading distributors. Verne is especially well versed in converter packaging grades and paper marketed directly off the paper machines, but naturally knows well, the entire THILCO line which he heads up in sales.

R. B. (Rudy) Vogt — Manager of Thilmany's Protective Paper Division, joined the company in 1940 after attending the Institute of Paper Chemistry at Lawrence College. He is closely associated with the many industries his division serves and is highly qualified for recommending "in-use" operations of THILCO papers in the technical phase of protective packaging. Rudy is presently Vice President of the Waterproof Papers Association.

N. A. (Norm) Zanzig — Advertising Manager and "Director" of the Thilmany exhibit literally knows the THILCO line from A to Z! Norm has "heard a lot about you" so here's a chance to tell him "your side of the story." Norm will be on hand to see you are directed to the THILCO representative who can best advise you on the papers for your specific needs.

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it might be considered a defect.

Products – Classifications

Foods. In the food field, products which can be dispensed as either a liquid, a foam, or a spray are innumerable. To mention just a few, there can be toppings, flavorings, sauces, syrups, spreads, drink concentrates, and salad dressings.

Toilet goods and cosmetics. Toothpastes are already destined to be the first product to appear in this classification. This is not accidental, since, for at least four years, attempts have been made to dispense toothpaste from a pressurized package with the use of liquified propellants.

The paste was dispensed in an aerated form with the use of such propellants. This was considered undesirable from the consumer's standpoint. This problem, together with the question of approval from the Food & Drug Administration of the fluorinated hydrocarbons for this use, prevented pressurized toothpaste from getting much beyond the experimental stage. Now, with the use of nitrogen for pressurizing the package, both problems have been solved.

In the cosmetic field, many products lend themselves to this type of packaging. It is especially a useful package for those products which have an ideal viscosity that makes them too thick for a bottle and too thin for a collapsible tube. Now we have the pressurized package. Cosmetic products which can be dispensed in non-aerated form with a nitrogen-pressurized package include antiperspirant cream, hand cream, hair dress, shampoo, cleansing cream, and vanishing cream. As spray products, there are such possibilities as colognes, mouth wash, and alcohol rub.

Industrial products. Artists' paints and colored pigments for decorator use can be readily dispensed in this manner. Other industrial products which offer possibilities for pressurized liquid dispensing are waterless hand cleaners, adhesives, and caulking compounds. For spray dispensing

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there can be window cleaners, whitewall tire cleaners, and soot removers. It is interesting to note that a pressurized spray package has been used for several years by gas station attendants for cleaning windshields. The refillable metal container is pressurized at the air pump after it is filled with a window washing composition.

Pharmaceuticals. Pharmaceuticals also offer several products which could advantageously be packaged in this manner. Vitamins, which are oxidized by air, can be dispensed dropwise without exposing the container contents to the atmosphere. Other pharmaceuticals which lend themselves to this form of packaging are ointments of various kinds, lubricating, and spermicidal preparations.

Containers – Regulations

Until very recently, pressurized packaging at pressures of 75 p.s.i.a. at 70° F. or over only covered two products, namely, whipped cream and shaving cream. Most aerosol products made with liquified propellants have a maximum pressure of 40 p.s.i.a. at 70° F. The regulation, therefore, presumably covering the nitrogen-packaged products would be Section 73.302 (a) (5) of Tariff No. 9 of the Interstate Commerce Commission, originally drawn up for whipped cream and later also applied to shaving cream.

Section 73.302 (a) (5)

"Applies to foodstuffs or soaps with dispensing pressures above 40 pounds per square inch absolute (approximately 25 pounds per square inch gage) at 70° F., but not over 105 pounds per square inch absolute (approximately 90 pounds per square inch gage) at 70° F. or 140 pounds per square inch absolute (approximately 125 pounds per square inch gage) at 130° F. The same type of can used for other aerosol containers may be used for foodstuffs or soaps, but must be capable of withstanding, without bursting, a pressure of two times the pressure of the contents at 70° F. or 1½ times the pressure of the contents at 130° F., whichever is greater."

Using the 140 p.s.i.a. at 130° F., this would calculate back at 70° F.

to 111 p.s.i.g. Actually, since the nitrogen has a greater solubility at lower temperatures, with products that have a pressure of 140 p.s.i.a. at 130° F., the pressure would be somewhat lower than 111 p.s.i.g. at 70° F. It would, therefore, appear that, if this regulation applies, pressures of 100 p.s.i.g. at 70° F. will be approved provided the container will withstand, without bursting, two times this pressure. Therefore, containers which will withstand a pressure of 228 p.s.i.a. (which is greater than 1-1/2 times the pressure at 130° F., or 210 p.s.i.a.) can be used at pressures of 100 p.s.i.g. at 70° F.

Drawn metal containers (two piece) and side-seamed metal containers (three piece) with the tab on the inside, will withstand these pressures. Both types of cans are now being used with nitrogen-pressurized toothpaste and chocolate syrup.

Consider headspace. At a given pressure, the amount of gas in the container is dependent on the headspace available. This becomes an important consideration in arriving at the amount of fill for a given container. With a headspace of 25 per cent of the volume of the container, the pressure when the container is nearly empty will be one-fourth of that when it is full. Thus, an initial pressure of 100 p.s.i.g. will drop to 25 p.s.i.g. when the container is depleted of product.

With viscous, high-gravity products such as toothpaste, a headspace of 33 per cent is desirable since the pressure will not drop as much at the completion of use, thereby assuring a high percentage of removal of the product. With toothpaste properly formulated and with sufficient headspace, it is possible at an initial pressure of 90 p.s.i.g. to expell over 90 per cent of the product, which compares favorably with collapsible tubes.

Containers – Types And Sizes

The volumetric capacities of steel cans now available for pressure packaging are shown in Table 1. These cans are available in various

when your product is used as a

COMPONENT PART

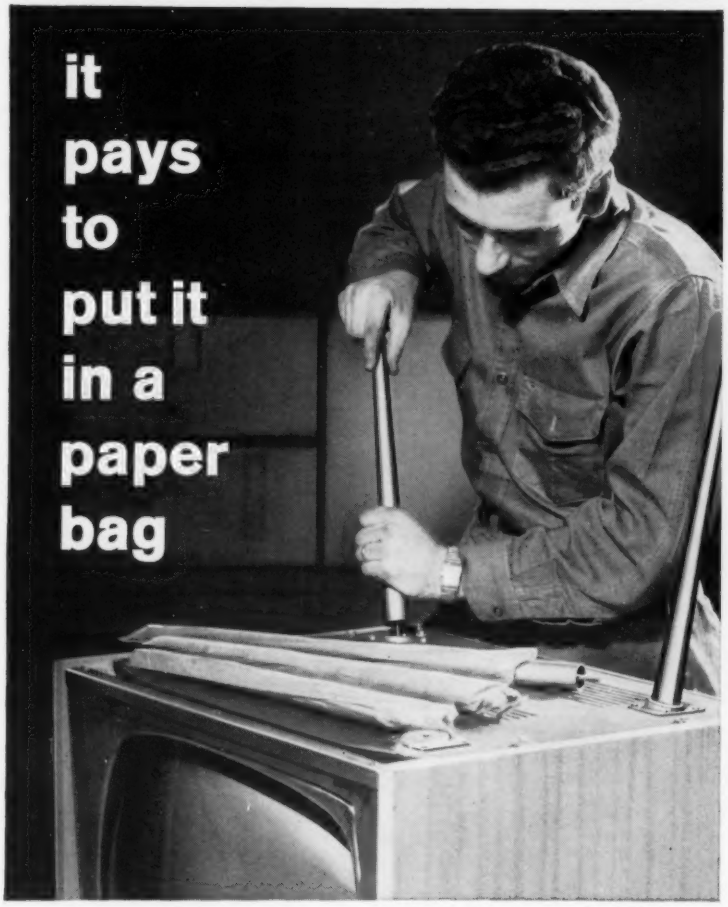

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Table 1—Volumetric Capacities of Steel Cans Available for Pressure Packaging

Nominal Capacity	Designation	Capacity by Measurement	
		cc.	fl. oz.
3-ounce	American or Continental 3-piece 202 x 214	150	5.07
6-ounce (regular)	American or Continental 3-piece 202 x 314	200	6.76
6-ounce (tall)	American or Continental 3-piece 202 x 406	230	7.78
9-ounce	American or Continental 3-piece 202 x 509	295	9.98
12-ounce	American or Continental 3-piece 211 x 413	415	14.03
14-ounce	American or Continental 3-piece 211 x 510	485	16.40
16-ounce	American or Continental 3-piece 211 x 604	540	18.26
6-ounce	Crown Spra-tainer 2-piece	215	7.27
12-ounce	Crown Spra-tainer 2-piece	375	12.68

weights of tin plate and with various types of resin coatings.

All of the can companies have been working on aluminum cans of about 6-oz. capacity, but nothing is available yet. Peerless Tube Company, Bloomfield, New Jersey, has a 3-oz., one-piece aluminum container which can be used for nitrogen-packaged products. Hunter Douglas Aluminum Corporation, Riverside, California, has distributed sample 6-oz., one-piece, aluminum containers, but has not indicated when it will go into production on this container. Sun Tube Corporation, Hillside, New Jersey, and Victor Industries Corporation, Brooklyn, New York, have also indicated that they expect to soon be in production on aluminum containers for pressurized products.

Valves

The development of suitable valves is perhaps the greatest factor in the marketing of nitrogen-pressurized packages. The vast amount of experience gained in the manufacture of valves for aerosol packages has been utilized to perfect this latest modification.

A spout had to be designed for non-aerated liquid products. This spout differs from previously-designed spouts for foam products in that it has a smaller cross-sectional area. There is still feverish activity on the part of valve manufacturers in the design of suitable spouts for these types of products.

Only two valve manufacturers are now marketing spouts that are suitable for non-aerated pressurized products. It would, of course, be highly desirable to have a spout which would close at the tip when the valve was closed, thereby eliminating the problem of product drying out at this exposed point. This is especially true of pharmaceutical products which must be kept sterile. One way of solving this problem would be to have a rubber or plastic cover to fit over the end of the spout.

Actuators for spray-type products no longer need the expansion chambers used in the actuators for liquified propellant products. For nitrogen-packaged spray products, it is necessary to have a mechanical breakup type of actuator. These are currently being produced by Calmar Company, Los Angeles, California, Precision Valve Corporation, Yonkers, New York, and Risdon Manufacturing Company, Naugatuck, Connecticut.

Controlling the flow. Orifice openings in the stem had to be increased in size and number to allow dispensing of heavy, viscous products. For aerosol products, only one 0.018-in. hole was sufficient; for nitrogen packaged products, three 0.030-in. holes can be used to advantage. Orifice openings on these valves are used to control the flow rate rather than as a restriction for the expansion chamber as in aerosol-type valves. *(Turn Page)*

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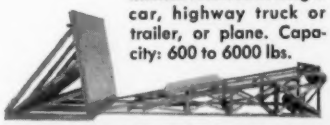

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Dip-tube diameter must be greater for heavy, viscous products such as toothpaste so as not to restrict the flow of material into the tube. It is also desirable to have a large volume in the dip tube so that a momentary opening of the valve when the container is in an inverted position will not expel all the nitrogen.

Although the public has been somewhat educated to the need for holding an aerosol container in a given position, this limitation is even more urgent in the case of nitrogen-packaged products. Should the valve be opened only for a matter of seconds when the dip tube contains no product, the pressurized gas will be lost, making the container useless as a dispensing package. This problem has been met by designing the spout to point in a downward manner so as to make it difficult to use the container in a tilted position.

Where desirable, products can be dispensed in a dropwise manner instead of a continuous stream. This is done by reducing the inside diameter of the dip tube and restricting the inner orifice of the valve.

Nitrogen Characteristics

Since the critical temperature of nitrogen is −232° F. and the critical pressure is 492 p.s.i.a., its physical state must be gaseous above that temperature and below that pressure. It is, therefore, obvious that a nitrogen pressure package will never contain liquified nitrogen. Nitrogen, however, can be shipped and stored in a gaseous or liquid state. The standard cylinder contains 224 cu. ft. of nitrogen at 70° F. at atmospheric pressure. It can be shipped in bulk gas trailers or bulk liquid trailers.

When it is shipped or stored as a liquid, its temperature is below its boiling point, −320° F. A container for liquid nitrogen must always be vented to prevent the pressure from getting very high. Heat loss of nitrogen by evaporation is kept at a minimum by using heavy insulation on shipping and storage containers of liquid nitrogen.

PVT Relationships Of Nitrogen

Nitrogen is very nearly an ideal gas and obeys Raoult's Law

$$PV = nRT \qquad (1)$$

where P = absolute pressure, V = volume, n = number of moles, R = gas constant, and T = absolute temperature. Using the relationship n = W/M, where W = weight of gas, and M = molecular weight of nitrogen, we arrive at the relationship

$$PV = \frac{W}{M} RT \qquad (2)$$

or

$$W = \frac{MPV}{RT} \qquad (3)$$

At a pressure of 90 p.s.i.g. and at 70° F., 1 gm. of nitrogen = 4.1 fl. oz. Thus, for a 16-oz. can (18.26 fl. oz.) which has 30 per cent headspace, we have

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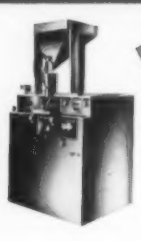

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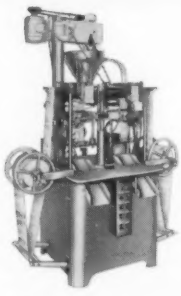

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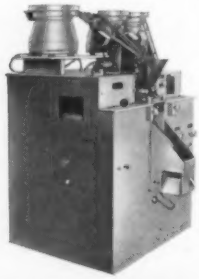

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$$\text{gm. of nitrogen} = \frac{0.30 \times 18.26}{4.1} = 1.3$$

Therefore, in the largest size can available, with the container 70 per cent filled with the product, there will be 1.3 gm. of nitrogen if filled to a pressure of 90 p.s.i.g. at 70° F. Likewise, a 6-oz. container (6.76 fl. oz.) filled to 70 per cent with product will contain only 0.5 gm. of nitrogen if pressurized to 90 p.s.i.g. at 70° F.

To convert pressure from one temperature to another temperature, we have the relationship

$$\frac{P_1}{P_2} = \frac{T_1}{T_2} \qquad (4)$$

where P_1 is pressure at temperature T_1, and P_2 is pressure at temperature T_2. From this relationship, we find that there is about a 2-p.s.i. increase in pressure with every 10° F. rise in temperature.

To convert pressure from one volume to another volume, we have the relationship

$$P_1 V_1 = P_2 V_2 \qquad (5)$$

where P_1 is pressure at volume V_1, and P_2 is pressure at volume V_2. Thus, for a 6-oz. can which has a pressure of 100 p.s.i.g. when pressurized with 2 fl. oz. of headspace, the pressure, when the product is completely discharged, will be

$$(100 + 14.7) \times 2 = P_2 \times 6.76$$

Then

$$P_2 = \frac{114.7 \times 2}{6.76} = 34 \text{ p.s.i.a.}$$

or

$$P_2 = 19.3 \text{ p.s.i.g.}$$

Although the pressure of the nitrogen has been reduced considerably, it is noteworthy that the amount of nitrogen in the container is still the same.

Compressibility Of Nitrogen

Although the relationship PV = nRT, for all practical purposes, holds true, there is a slight deviation from Raoult's Law because of the compressibility of the nitrogen as can be shown by the following:

At 0° C., 1 atm.,

$$PV = 1.00$$

at 10 atm.,

$$PV = 0.9962$$

Therefore, upon increasing the pressure from 14.7 p.s.i.a. to 147 p.s.i.a., the volume will be decreased by 0.38 per cent [(1.00 − 0.9962) × 100] from that obtained by Raoult's Law.

Solubility Of Nitrogen

One factor which cannot be neglected, however, in calculating PVT relationships is the solubility factor. Solubility of nitrogen in water at various temperatures at 1 atm. pressure is shown in Table 2. The values given are ml. gas reduced to 0° C. and 760 mm. of mercury dissolved in 1 ml. of water at designated temperature.

Table 2 — Solubility of Nitrogen in Water

Values given are ml. gas reduced to 0° C. and 760 mm. of mercury dissolved in 1 ml. of water at designated temperature.

Temperature ° C.	ml. gas (STP)
0°	.0235
15°	.0168
20°	.0154
25°	.0143
30°	.0134
40°	.0118
50°	.0109
60°	.0102

As can be seen in this table, the solubility decreases with increase in temperature. Conversely, the solubility increases with increase in pressure.

The solubility of nitrogen in water is much less than in many other chemicals. Table 3 gives the solubility of nitrogen in other substances as volumes of gas per volume of liquid at 25° C. and 760 mm. The gas volume is reduced to standard conditions, 0° C., 760 mm. Hg.

Although nitrogen, because of availability and cost, will be the gas most useful for pressurized packaging, other gases can be used where special solubility characteristics or chemical properties are desired. A list of such gases and their boiling points (° F.) follows:

Carbon Dioxide	−109.2 (sublimes)
Nitrous Oxide	−127.2
Argon	−302.5
Oxygen	−297.3
Hydrogen	−423.0
Helium	−452.0
Neon	−410.9
Krypton	−243.8
Xenon	−162.2

Manufacturing Methods

Since the nitrogen must be charged to the container as a gas, the product will be filled into the container, the valve crimped into place, and the gas charged through the valve to a given pressure. Because the quantity of gas is small, it is more practical to charge to a pressure rather than a weight.

Several of the contract loaders who were manufacturing aerosol products have already set up to handle nitrogen-pressurized products. Most of the equipment used on these production lines is adaptable to this operation. Piston fillers used for filling viscous products can be used for filling the product into the can.

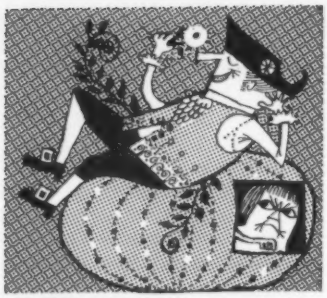
The valve is crimped with the same equipment that is used on aerosol products. The nitrogen is then charged through the valve with a head especially adapted for

Table 3 — Comparative Solubility of Nitrogen in Water and Other Liquids

Solubility values given are volumes of gas per volume of liquid at 25° C. and 760 mm. The gas volume is reduced to standard conditions, 0° C., 760 mm. mercury.

Substance	Solubility
*Water	.016
Acetone	.15
Acetic Acid	.12
Methyl Alcohol	.14
Ethyl Alcohol	.14
Aniline	.03
Amyl Acetate	.15
Chloroform	.13
Carbon Disulfide	.06
Nitrobenzene	.06
Benzene	.12
Xylene	.12
Amyl Alcohol	.12
Toluene	.12
Ethyl Acetate	.17
Isobutyl Acetate	.17
Methyl Acetate	.18
Cottonseed Oil	.061
Corn Oil	.063
Soya Oil	.12
Linseed Oil	.063
Olive Oil	.060

*In sucrose or invert sugar solutions the solubility of nitrogen is reduced below that in pure water.



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this operation. The cans are then passed through a standard water bath to detect leakers. It should be noted that the I.C.C. regulations (Section 73.302 (a) (5)) do not require testing at 130° F.

Can-handling equipment now being used on aerosol products can be used for nitrogen-pressurized products.

Critical factors. Quality control on valves and containers is similar to such control on aerosol products except perhaps even more critical. It has been found, for example, that flash seen only by microscopic examination, left on valve components is sufficient to cause valve leakage.

It must be remembered that with only a fraction of a gram of nitrogen in each container, leakage becomes an extremely critical quality-control test. Containers likewise must be free from all possible leakage. The crimp also comes in for careful examination and control to be assured that it will be gas-tight at the charging pressure.

Outlook And Predictions

Very shortly, three of the major brands of toothpaste will be marketed in nitrogen-pressurized containers. Should this product be accepted by the public, and there is every reason to believe it will be, this could conservatively account for 100 million packages a year within a year or two.

Cosmetic products such as hand lotions, cleansing creams, and shampoos are being tested now. All of these are large volume sales products. It is not difficult to see that the successful marketing of only a few of these products, not to mention foods and pharmaceuticals, would skyrocket pressurized packages to heights undreamed of even with aerosols.

New valve designs. As a result of this growth, there will surely be new valve-spout designs as well as improvements and refinements in the already highly-developed aerosol valves. Aluminum one-piece containers for nitrogen-pressurized products are feasible and practical. The three major can companies as well as others are working on the development of an aluminum pressure container. Certainly this would be an ideal container for toothpaste as well as for such things as various food and phramaceutical products.

Tests are now being made to determine the suitability of glass containers, coated or otherwise, for nitrogen-pressurized products. This certainly looks like a possibility in view of the fact that carbonated beverages at pressures of 45 p.s.i.g. at 70° F. are packaged in glass bottles. Nitrogen-pressurized packages are certainly comparable when at these same pressures.

In this modern era of rockets, satellites, and atomic fuels, packaging is keeping pace by becoming pressurized. Nitrogen under pressure now stands ready and waiting like the genie of Aladdin's lamp to deliver a product to a toothbrush, our hand, or anywhere else we want it by merely a flick of the finger.

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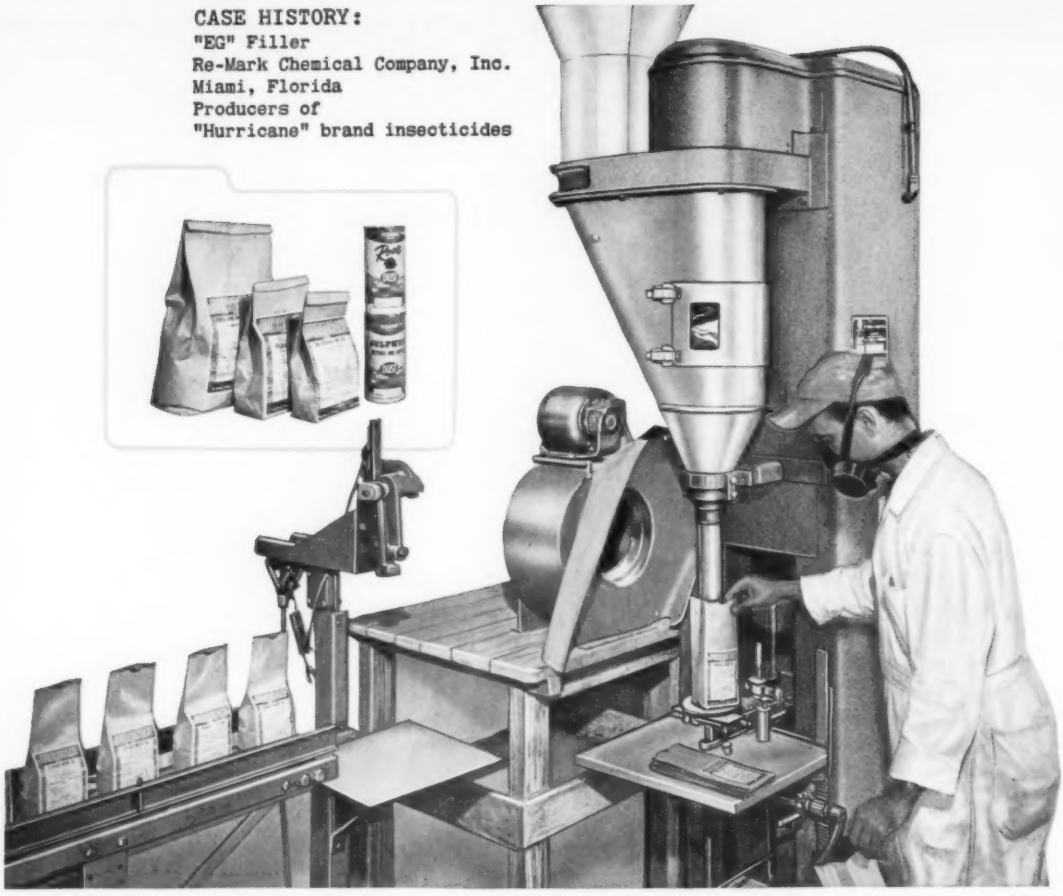

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Eastern Duo-Fast Corp.	1209-11	
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FMC Packaging Machinery Div.	1208-10-12-14	Essex House
Foam-Pak Co.	909	
Follansbee Steel Co.	119	
H. B. Fuller Co. of Ohio	1728-30	
Gaylord Container Corp., Div. Crown Zellerbach Corp.	829-33-35	The Barclay
General Box Co.	1525-27	Statler
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General Corrugated Machinery Co., Inc.	325	
General Gummed Products, Inc.	425	
General Plastics Corp.	239	
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Gibbs Automatic Moulding Corp.	410	Park Sheraton

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The Gilman Brothers Co. .....524....Park Sheraton

Gisholt Machine Co. 1004
Glassine & Greaseproof Mfrs. Assn. 1708-10-12-14
Globe Heat-Seal, Inc. 2235
Globe Ticket Co. .....117....Barbizon-Plaza

The Goodyear Tire & Rubber Co. 2006, 2012....St. Moritz
Adolph Gottscho, Inc. 1205-07
Graeber Stringing & Wiring Machine Co. .....1030....St. Moritz
Gray Co., Inc. .....128....Lexington
The Greif Bros. Cooperage Corp. .901,1001....New Weston
Griffin-Rutgers, Inc. 907
B. F. Gump Co. .....1501, 1600....Wellington
Ferdinand Gutmann & Co. .....1130....St. Moritz

Hake Mfg. Co. 735
Hampton Mfg. Co., Industrial Tape Div. 2003
The Hankins Container Co. 1704-06
Hansella Machinery Corp. 220
Harkin Affiliates, Inc. 909
Harris-Intertype Corp. .....238....Henry Hudson

Hayssen Mfg. Co. 1224-26
Hedwin Corp. .....916....Barbizon-Plaza

H. H. Heinrich Co. 1433
Hobbs Mfg. Co. 430
Allen Hollander Co., Inc. 1129
Hope Machine Co. .....2319-21....Victoria
Hoover Electronics Co., Instrumentation Div. .....304....Sheraton-Astor

Howard Publishing Co. 419
Hydraulic Controls Div., North American Mfg. Co. 905

The I. D. Co. 2330
Ideal Stencil Machine Co. .....1903, 2000....Henry Hudson

Imco Container Corp. .....728....Essex House
The Impact-O-Graph Corp. .....204....Manger-Windsor

Intaglio Service Corp. 1619
The Inta-Roto Machine Co., Inc. .....504....Wellington
Interchemical Corp., Printing Ink Div. .....2016, 2020....Essex House
International Eastern Co. 919
International Paper Co. .....629-33-35....Belmont Plaza

International Staple & Machine Co. ..2004

Janesville Cotton Mills 931
Jet-Pak, Inc. .....1634....Essex House
Jiffy Mfg. Co. .....2112....Barclay
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Kidder Press Co., Inc. .....1810....Plaza
A. Kimball Co. 935
Kimberly-Clark Corp. .....2115....Park Sheraton

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LectrOmatic Devices, Inc. .....114....Essex House
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Mid-States Gummed Paper Co. ....1604-06....Essex House
Miller Wrapping & Sealing Machine Co. 1208-10-12-14-16-20
Milprint, Inc. .....1721....Biltmore
Minnesota Mining & Mfg. Co. ..1905-07-13....Essex House
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Mojonnier Associates, Inc. .....2023-25....Park Sheraton

The Monarch Marking System Co. ....409....Barbizon-Plaza

Monsanto Chemical Co. .....2116-20-24-26....St. Moritz
Morningstar-Paisley, Inc. .....624....Savoy Plaza
Mosstype Corp. .....2320-22....Park Sheraton

Hours of the Exposition

Monday, May 26—10:00 a.m. to 6:00 p.m.
Tuesday, May 27—10:00 a.m. to 9:00 p.m.
Wednesday, May 28—10:00 a.m. to 6:00 p.m.
Thursday, May 29—10:00 a.m. to 6:00 p.m.
Friday, May 30—10:00 a.m. to 4:00 p.m.

Note: There is a $2.00 fee for registration for the 27th National Packaging Exposition—payable only at the registration desk at the show.

These are the hotels where exhibitors are staying

Ambassador
Park Avenue & 51st Street
Plaza 5-1000

Barbizon-Plaza
106 Central Park South
Circle 7-7000

The Barclay
111 E. 48th Street
Plaza 5-5900

Belmont Plaza
Lexington Avenue & 49th Street
Plaza 5-1200

Biltmore
Madison Avenue & 43rd Street
Murray Hill 7-7000

Chemists Club
52 E. 41st Street
Lexington 2-7649

Commodore
Lexington Avenue & 42nd Street
Murray Hill 6-6000

Essex House
160 Central Park South
Circle 7-0300

Henry Hudson
353 W. 57th Street
Columbus 5-6100

Lexington
Lexington Avenue & 48th Street
Plaza 5-4400

Manger-Windsor
100 W. 58th Street
Columbus 5-2100

Manhattan Towers
Broadway & 76th Street
Susquehanna 7-1900

Martinique
Broadway & 32nd Street
Pennsylvania 6-3800

Mayflower
Central Park West & 61st Street
Columbus 5-0060

Metropolitan Club
1 E. 60th Street
Templeton 8-7400

Navarro
112 Central Park South
Circle 7-7900

New Weston
Madison & 50th Street
Plaza 3-4800

New York Athletic Club
7th Avenue & 59th Street
Circle 7-5100

New Yorker
8th Avenue & 34th Street
Longacre 3-1000

Park Lane
299 Park Avenue
Plaza 5-4100

Park Sheraton
7th Avenue & 55th Street
Circle 7-8000

Plaza
5th Avenue & 59th Street
Plaza 9-3000

Roosevelt
Madison Avenue & 45th Street
Murray Hill 6-9200

St. Moritz
50 Central Park South
Plaza 5-5800

St. Regis
5th Avenue & 55th Street
Plaza 3-4500

Salisbury
123 W. 57th Street
Circle 6-1300

Savoy Plaza
5th Avenue & 58th Street
Eldorado 5-2600

Sheraton
870 7th Avenue
Circle 7-8000

Statler
7th Avenue & 33rd Street
Pennsylvania 6-5000

Taft
7th Avenue & 50th Street
Circle 7-4000

Tuscany
120 E. 39th Street
Murray Hill 6-1600

Victoria
7th Avenue & 51st Street
Circle 7-7800

Waldorf-Astoria
50th Street & Park Avenue
Eldorado 5-3000

Warwick
65 W. 54th Street
Circle 7-2700

Wellington
7th Avenue & 55th Street
Circle 7-3900

MRM Co., Inc. 1535-37
The Multistamp Co. 1507
Mystik Adhesive Products 529

Narrow Fabrics Co., Div. Burlington Industries 1808
Nashua Corp. .....1437....Park Sheraton
National Barrel & Drum Assn., Inc. ..308....Roosevelt
National Bundle Tyer Corp. 1626
National Can Corp. .....232-34....Roosevelt
National Container Corp. .....408-09-10....Ambassador
National Equipment Corp. 1812-14
National Metal Edge Box Co. .....2130....Roosevelt
National Paper Box Mfrs. Assn, Inc. ..1431....Roosevelt
National Starch Products, Inc. .....1319....Henry Hudson
New Era Mfg. Co. .....1028....St. Moritz
New Jersey Machine Corp. ....1431-32-34....Essex House
North American Mfg. Co. .....905....Taft

Olin Mathieson Chemical Corp., Film Div. 528-30
Oliver Machinery Co. .....1536....Mayflower
Olsenmark Corp. 306
Oppenheim Co. .....1709....Essex House

AMA CONFERENCE PROGRAM

American Management Association is holding its 27th annual National Packaging Conference May 26-28 at the Statler Hotel, New York. Following are the features of the program and the speakers discussing them.

Monday, May 26th:

9:30 a.m. to 12 noon. Glassware production at Gerber. John C. Suerth, general manager, manufacturing, and E. N. Burnett, chief engineer, Gerber Products Company, Fremont, Michigan, will discuss how their company maintains its profits in a highly competitive market and will outline the cost reduction program enabling it to hold price levels despite increasing costs of materials, labor, and freight. They will explain how Gerber gets better containers, caps, labels, and corrugated boxes through enforcement of rigid specifications, through efficient quality control procedures, and through cooperation with suppliers. They will illustrate how Gerber's packaging line production rate has been speeded up through resourceful engineering concepts.

Tuesday, May 27th:

9:00 a.m. to 12 noon. Advanced mechanization of packaging lines. William T. Dooley, Jr., vice president, Robert B. Etter, Jr., plant superintendent, and Philip H. Lanhan, engineer, Lewis-Howe Company, St. Louis, Missouri, will review their company's "systemated" packaging and trace the manufacturing and packaging techniques that have enabled their company to keep the price of "Tums" unchanged since the introduction of this product. They will tell how the company arrived at its concept of "systemation," a means of engineering the integration of machines into a self-regulating system by fashioning electrical and mechanical devices to permit the product itself to perform the duties of control.

Wednesday, May 28th:

9:00 a.m. to 12 noon. Integrated material handling. C. L. Hanchett, supervisor, material handling engineering and inventory planning and handling, and W. A. Albrecht, superintendent of handling methods and equipment, Ford Division, Ford Motor Company, Dearborn, Michigan, will outline Ford's integrated material handling system They will tell how individual requirements and interdependent relationships of product design, packaging, shipping, and intra-plant handling are analyzed to develop methods to effect the economical movement and storage of material. They will discuss specifically intra-plant and in-plant material handling; packaging and shipping materials, containers, and methods; and aids to vendors in their packaging and shipping.

Ortman-McCain Co.	408	Salisbury
Oskosh Engraving Co.	360	
Owens-Illinois Glass Co.	1405-09-13	Ambassador
Oxy-Dry Sprayer Corp.	401,500	
Packaging Industries Ltd., Inc.	2104-06	
Packaging Parade	2131	New Yorker
Packing and Shipping	2415	
Pack-Rite Machines, Div. of Techtmann Industries	2100-02-03	Martinique
Pak-Rapid, Inc.	1122	Chemists Club
Pantasote Company	130	
Parsons & Whittemore Graphic Corp.	132	
Permacel-Le Page's Inc.	1819-23-25	
Perry Industries, Inc.	1608	
The Pfaudler Co.	1636	New Yorker
Photo Process Screen Mfg. Co.	929	
Pitney-Bowes, Inc.	1633-37	
Plastic Jewel Co., Inc.	1020	
Plastic Packaging Corp.	405	Navarro
Plastic Packaging Machinery Co., Inc	141-42	
Plastics World	1202	
Plast-O-Pak Corp.	911	
Plastocraft Co.	137	
Plas-Ties Co.	135	
Plax Corp.	1201, 1305	Essex House
Plaxall, Inc.	2315	
Poly-Seal Corp.	233	
Popper & Sons, Inc.	1629	
Potdevin Machine Co.	1828	Park Sheraton
Print-A-Tube Co.	140	
The Printing Machinery Co.	2200	Taft
Rainbow Ribbons and Fabrics, Inc.	329	
W. Ralston & Co.	913-15	
Rapid Ribbon Corp.	2031	
The Rapids-Standard Co., Inc.	724-26-26	Plaza
Reynolds Metals Co.	1921-25	Park Central
Rheem Mfg. Co.	1136-38	New Weston
J. A. Richards Co.	2416	Henry Hudson
Riegel Paper Corp.	1419	
Rossotti Lithograph Corp.	1916	
Sani-veyor Corp.	1108	
William B. Sanford, Inc.	1623	
Scale Specialties	213	
Schaefer Machine Co.	1615-17	
G. T. Schjeldahl Co.	1014	
Seal-O-Matic Dispenser Corp.	427	
The Seamless Rubber Co.	2426	Essex House
Shaw-Randall Co., Inc.	1611-13	Tuscany
Shear Prinz Associates	921	Taft
Shipping Management	1531	
Shopsin Paper Co.	240	
Signode Steel Strapping Co.	729	
The Simco Company	1124	Barbizon-Plaza
Simplex Binder Co.	108	
Sinclair and Valentine Co.	533-35	
Simco, Inc.	209-11	
Soabar Co.	333	
Southern Special Products, Subs. Nat'l Metal Edge Box Co.	2121	Plaza
Speedry Products, Inc.	2202	
Spencer Chemical Co.	316-18-20	Henry Hudson
Standard Corrugated Case Corp.	412	
Standard Instrument Corp.	237	
Standard-Knapp, Div. Emhart Mfg. Co.	1915	
Stanford Engineering Co.	1213-15-17-19	Commodore
The Stanley Works	219	
Sten-C-Labl, Inc.	100	
Sterling, Fleischman Co.	129	Barbizon-Plaza
Stoffel Seals Corp.	109	
F. J. Stokes Corp.	625	St. Moritz
Sun Chemical Corp., General Printing Ink Div.	1932	Park Sheraton
Sun Tube Corp.	1511-13-15-17-19 1610-12-14-16-18	Park Lane
Swift & Co., Adhesive Products Dept.	1227-31	Park Sheraton
Switzer Bros., Inc.	230	
Syntron Company	2021	
Technical Tape Corp.	193-15	
Tee-Pak, Inc.	1534	Park Sheraton
Tele-Sonic Packaging Corp.	1019-23	
Thilmany Pulp & Paper Co.	121-24-222-26	Mayflower, St. Moritz
Thomson National Press Co., Inc.	516	Barbizon-Plaza
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Toledo Scale Co.	628	
Tomkins Label Service	2207	Barbizon-Plaza
Tri-City Container Corp.	2435	
Tri-Wall Container, Inc.	828	Park Sheraton
Tronomatic Machine Mfg. Corp.	411	
C. E. Twombly Co.	2225	Plaza
Union Bag-Camp Paper Corp.	2216-20-26	Savoy Plaza
Union Paste Co.	1112-14-16	Park Sheraton
Union Steel Products Co.	734	Park Sheraton
Unit Packet Corp.	227	Savoy Plaza
United Mineral & Chemical Corp.	2423	
U. S. Bottlers Machinery Co.	2430	Commodore
U. S. Engineering Co.	2336	
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Vac-Tie Fasteners Inc.	1126	
Van Buren Wrapping Machine Corp.	1715	
B. Verner & Co., Inc.	928	
Vertrod Corp.	1132	
Victory Container Corp.	924	St. Moritz
The Visking Corp.	1404	St. Moritz
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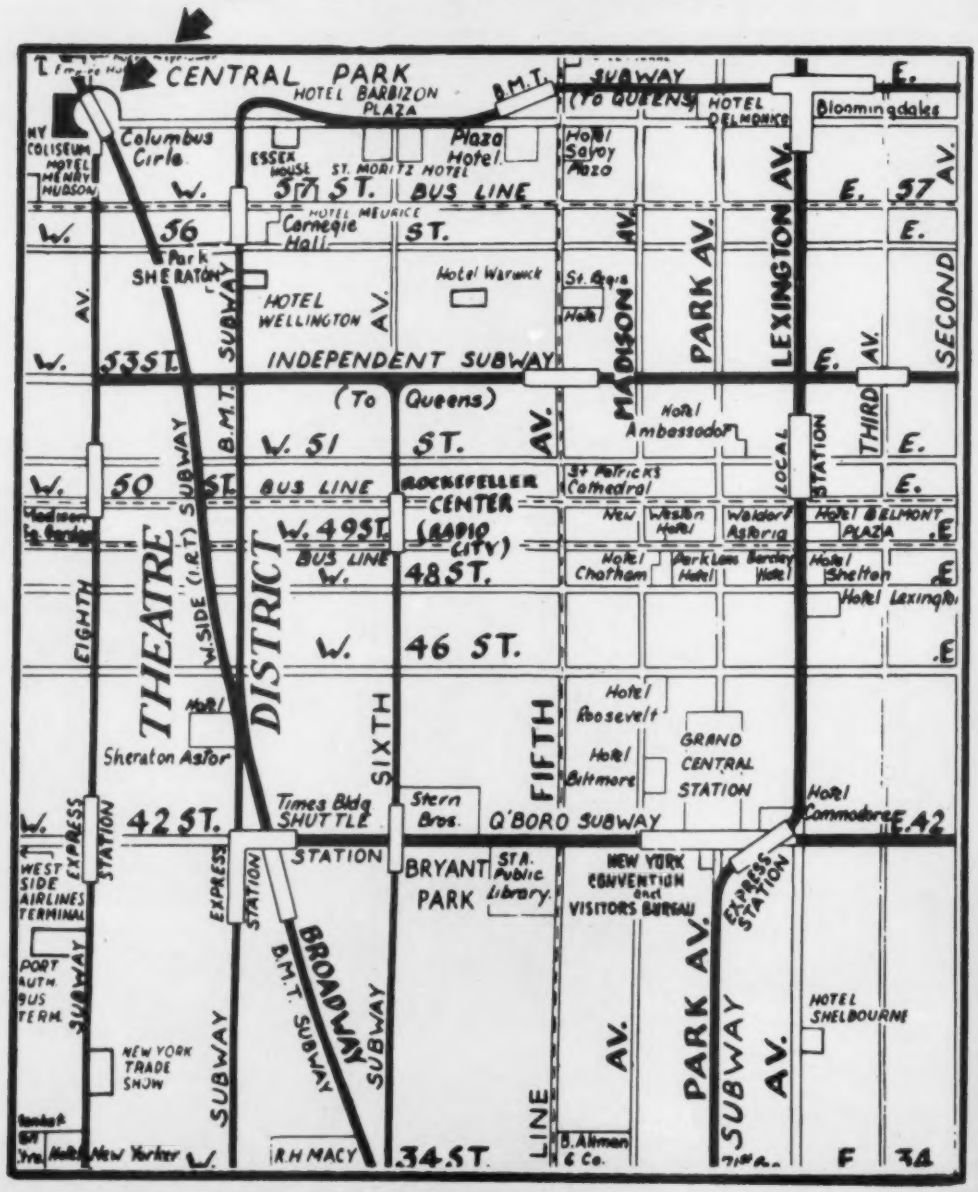
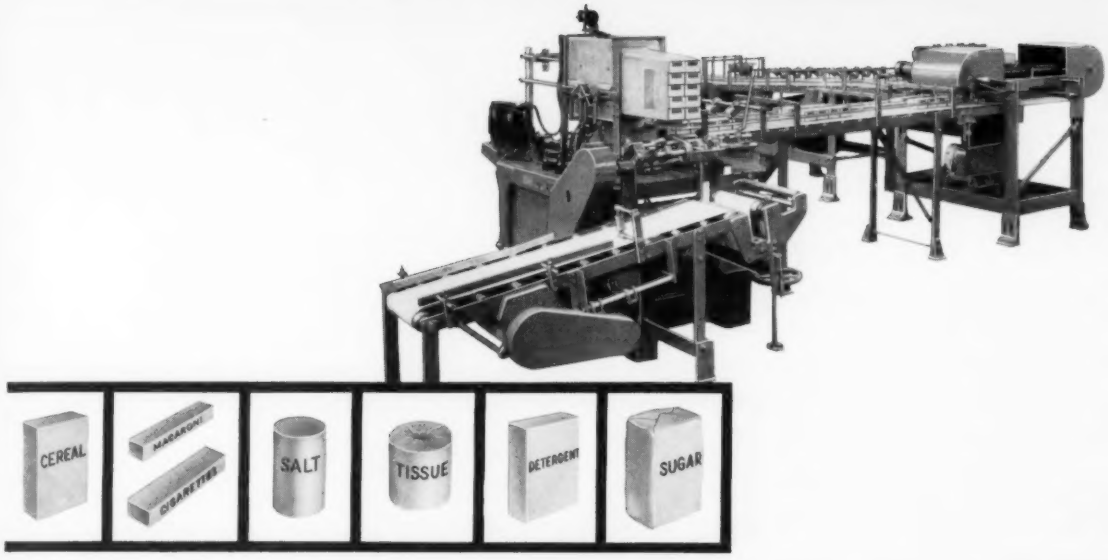
Waldorf Paper Products Co.	1240	Barclay
John Waldron Corp.	134	Biltmore
S. D. Warren Co.	932	Park Sheraton
Web Controls Corp	212	
Weber Marking Systems, Div. of Weber Addressing Machines, Co., Inc.	2002	Barbizon-Plaza
West Instrument Corp.	424	Henry Hudson
West Virginia Pulp and Paper Co.	1420	
Weyerhaeuser Timber Co., Special Products Div.	304	
T. C. Wheaton Co.	1734-36	
Frank W. Winne & Son, Inc.	1115	Park Sheraton
Wolverine Paper Converting Machinery Corp.	1505	Henry Hudson
Wood Conversion Co.	1716-18	
Wrap-Ade Machine Co., Inc.	1121	
Wrap-King Corp.	2231-33	
Wyomissing Paper Products Div., The Narrow Fabrics Co.	413	Statler
York Tape Printers, Inc.	1630	Park Sheraton

New York Coliseum



STANDARD-KNAPP CARTON PACKERS
CUT COSTS



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SEE THE STANDARD-KNAPP CARTON PACKER IN OPERATION AT THE NATIONAL PACKAGING EXPOSITION – BOOTH 1915

EMHART MANUFACTURING COMPANY
STANDARD-KNAPP DIVISION
PORTLAND, CONNECTICUT

For more information circle No. 234 on Reader Service Card

Wayne S. Madden is a graduate of Iowa State College, with a B.S. in general engineering. He joined Montgomery Ward Paint Factory (Wardway) in 1956 and is in charge of its engineering and maintenance program. Prior to joining Wardway he was employed by the J. L. Ferguson Company. He is a member of the National Society of Professional Engineers and the Western Society of Engineers.

Providing equipment to code-mark cases in limited space

By Wayne S. Madden,
Engineering and Maintenance Supervisor,
Montgomery Ward Paint Factory (Wardway Paint Works),
Chicago Heights, Illinois

A decision to code-mark the ends, rather than the sides, of cases of paint cans exposed a problem. Limited space at the discharge points of two sealers, plus a case conveyor running through the area at an angle, precluded use of commercially available marking equipment. To do the job, Wardway built its own unit to turn, mark, and redirect the 13-in. long cases in a machine only 16 in. wide between frames. Its special features include use of powered, free rolling, and stationary rolls, as well as flight bars and skate wheels to assure a smooth movement past the imprinting unit.

Our stores and warehouses recently concluded that their method of stacking cases of paint cans required a change. This entailed stacking of cases with case ends, rather than sides, exposed on the shelves. To meet this need, we had to provide a way of code-marking these cases on their ends, rather than on their sides as we had been doing.

To accomplish this, we had to take cases discharged from the case sealers, turn the cases, mark them, and deliver them to an inclined, powered conveyor going directly from the packaging area to the warehouse. This case take-away conveyor not only inclines up to the ceiling, but comes into the room at an angle and takes cases from another line as well as the line in question here. To change it, we would have two of our three packaging lines down during a period of heavy production.

Our packaging line is so long that the labeling operation is in the adjoining room and the movement of even a foot would have hampered the packing operation. We decided we would lose less production by building a machine to fit into the space available. We moved it in and wired it up completely on a Saturday, so that the only production time lost was to acquaint the operators with the new machine.

How To Mount Coder?

Since the packaging line involved quart cans only, we were able to confine our developments to cases of six quarts each. Further, we had a five-line Kiwi coder available. It is basically a standard unit which utilizes removable curved rubber plates holding up to five lines of movable type. We had several of these plates made up in advance to provide us the various combinations of markings needed. It takes just a few seconds to change and is so simple to use that production was very reluctant to change to some other system.

Change direction twice. Therefore, the crux of our problem was how to mount the coder so it could imprint the ends of the cases. To do this, we had to change the direction of the cases twice without turning them. The unit takes cases discharged from a case sealer; a flight bar moves them in a direc-

tion perpendicular to the flow of work from the case sealer, imprints the cases as they pass the coder, and discharges them to a caster wheel table, which changes the direction another 90°. We had enough pitch so that a very short skate wheel conveyor could be used to transport the cases to the powered take-away conveyor.

Use Standard Components

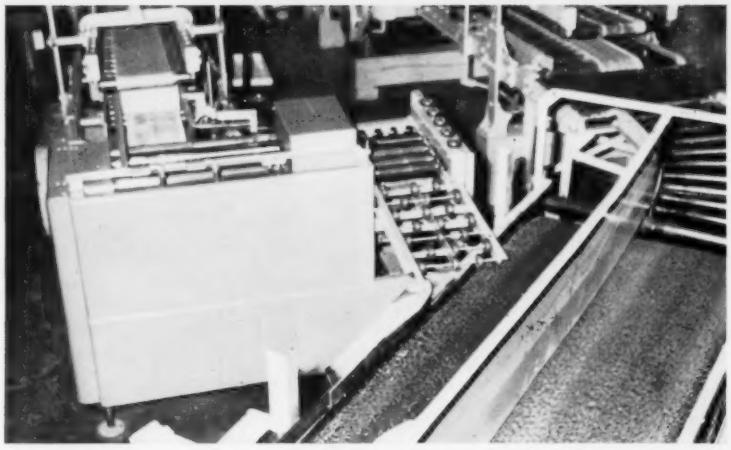
Our starting point was to get our dimensions, determine the speeds involved, and time our mechanism accordingly. We already had a detailed layout of the entire line. Thus we could safely do this entire job directly in our shop and avoid having to blueprint the project and put it on a drawing board. In constructing our unit, we used standard components wherever possible. Our major frame assembly is built of two-inch square structural tubing.

How motors work. The unit has two separate drive motors interlocked with the case sealer. In practice, we have a double interlocked system connected to 110 volts a.c. current. There is a separate motor driving the rolls which takes the cases from the case sealer and feeds them into the unit. Unless this motor is operating, the motor driving the flights won't operate; and if the flight motor is not ready to operate, the case sealer will not operate. A pilot light at the opposite end of the packaging line shows the girls when the feed-in motor is running so they can start the case sealer.

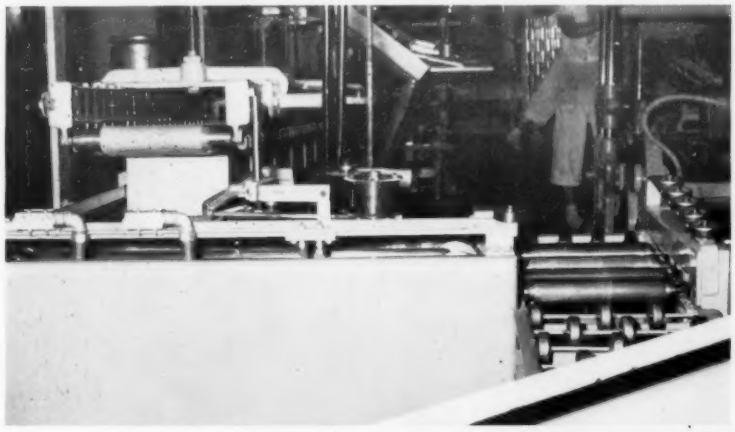
Immobilize One Roll

Cases are normally fed into the unit at 14 to 15 cases a minute, although at the end of each batch of paint the case sealer is cleaned out and the last cases tagged to eliminate errors in warehousing. During this time, cases are handled at the rate of about 30 cases per minute. We built the machine to handle this peak load to reduce change-over time between batches of paint.

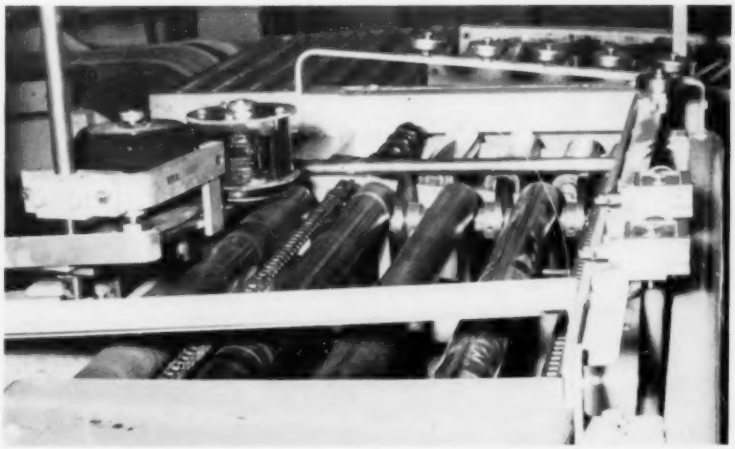
As a case moves into the unit



Limited space precluded use of commercially available equipment and dictated construction of case turning equipment to fit in between case sealers and angled take-away conveyor seen in foreground. Case visible at top is passing through coder.



Cases to be marked and turned emerge from sealer as seen at left, then move past coder (center), and pass to turning station at right. They then discharge via skate wheels (lower foreground) and pass to outgoing conveyor, whose frame appears in lower right.



Of these four rolls on which cases move, the first two (left) are powered, the second is free-rolling, and the fourth (right foreground) is immobilized. Also, the first (powered) roll is knurled—to insure its being able to pull each case away from the sealer.

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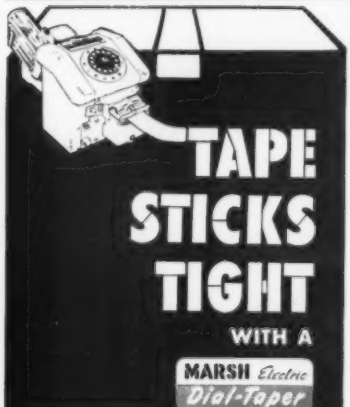

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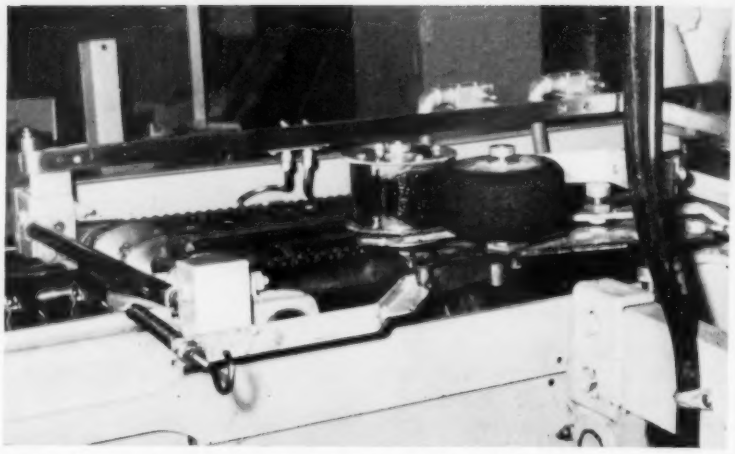
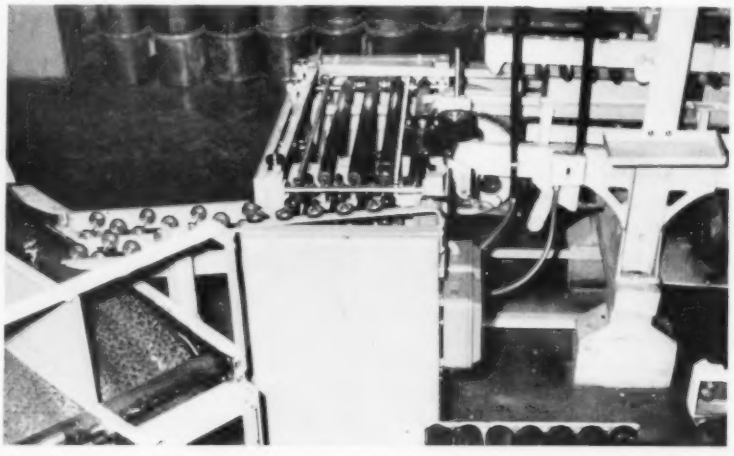
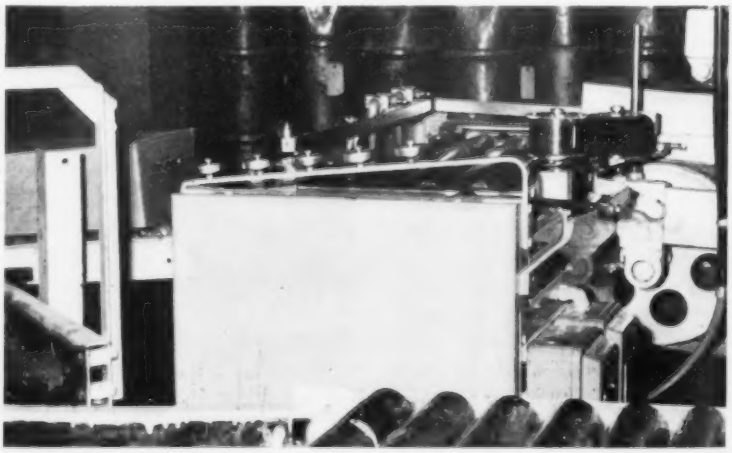


This five-line coder is positioned so that it marks the ends (not sides) of cases passing it. Case moving right to left (right foreground) will change direction without turning, to move from right to left past coder—then changes direction again.



Passing over short section of skate conveyor, marked cases move off on take-way conveyor at left. Pitch of roll conveyor makes leading edge of case drop slightly farther than trailing edge; plant had to move roll back so edge of case would clear last roll.



Skate wheels mounted (center foreground) on outer end of frame running downward at angle to frame act as shock absorbers. Cases being turned strike these wheels at the point of changing direction (to go to take-away conveyor) and thus are not damaged.

it passes over four rolls. The first two are powered, the third is free rolling, and the fourth is immobilized in a stationary position to reduce bounce as the case rushes in against the stop. All are standard conveyor rolls, but the first powered roll is knurled to insure its pulling the case away. And we found it makes a big difference to have the fourth roll stationary, rather than free.

Movement of case. Passing over these rolls, the case hits two Micro switches. Either one would be sufficient, but we installed two so that if a case goes in at a slight angle, it is certain to hit one of the switches. At that instant, a flight bar moves into position and pushes the case at a 90° angle. The case slides lengthwise down the three rolls. Cases of paint are heavy and this double-duty service of rolls reduces friction considerably. The flight bars are stopped about four inches behind the case, so the motor reaches full speed without the handicap of starting under full load. The flight speed is about 125 feet per minute.

Making Final Transfer

In pushing the case to the transfer point, our biggest problem was the transfer back to the original direction. This is the second 90° change of direction, after the case has been imprinted. At this point, we utilized the speed of the case and gravity. To facilitate the actual transfer, we fastened 3/8 in. thick steel discs to the flight sprocket shaft at the discharge end. These discs were somewhat greater in diameter than the sprockets and lifted the front end of the case slightly up onto a 3/4 in. diameter roll equipped with sealed ball bearings to make it roll easier. This roll keeps the leading end of the case from dropping down and stopping as soon as the flight bar clears the cases. We originally installed two of these 3/4 in. rolls, but the flight bar came so close we were afraid someone would get his fingers caught between them.

Use of casters. Following the

Another first for PLAX containers!

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LOWERS HANDLING COSTS ACCELERATES PRODUCTION

• Conveyor carries units to other operations such as filling, capping, labelling, etc. Handles up to 100 units per minute depending upon diameter.

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case again, the discs on the outlet sprocket shaft lift the case slightly; then the 3/4 in. roll lifts it perhaps another 1/8 in., so when it actually leaves, the case tends to fly out into space before dropping down onto a short roll conveyor. Actually, it still didn't consistently go far enough during our initial use of this equipment. For this reason, the first or end-most roll was removed and four small commercial casters were installed. They have ball bearing swivels and offer almost no resistance to movement in any direction. They solved that problem.

Now however, the case came too fast and would hit the frame, bounce back, and hang up. To cure this we mounted four more skate wheels on the outer end of the frame running downward at an angle to the frame following the pitch of the discharge roll conveyor. These roller skate wheels have a cushioning effect and absorb the shock of this point without damage to the case.

The case now rolls freely in its new direction, goes over the rolls, and out the unit; it then passes over a very short section of skate conveyor and transfers to the moving belt of the take-away conveyor. One other problem did arise on this final discharge roll conveyor. The leading edge of the case drops slightly farther than the trailing edge due to the pitch of the roll conveyor. The inertia from the fall was enough to distort the case so it would not roll up and over the last roll. We moved the roll back so the edge of the case dropped onto it and had no more trouble.

Control Of The Flight Chains

In order to get the right amount of chain to go around and yet give minimum flight speed, we had to put in three flights. The flight itself contacts a trip lever which activates another Micro switch breaking the holding coil circuit in the starter and stopping the motor. At first, we tried using a lever type Micro switch alone, but the speed of the flight bar was so great that the coil would not have time to de-energize completely, and occasionally the flights would run around several times before stopping. We used Federal starters because of their automatic resetting feature.

Cut stopping time. We have a continually dragging brake to reduce stopping time; there is not enough room for a brake motor. We were somewhat concerned that as the chain was used it would stretch and perhaps drop down and catch upon the ends of the feed-in rolls. To prevent this we used some more roller skate wheels so the flight rolls over and then on top of the feed-in rolls.

As for the Kiwi coder, all we had to change was the spring holding tension against the case. We bolted an arm to the frame of our unit and mounted it as it was originally designed. We built our unit with adjustable legs so we could adjust its height. This is a useful feature since it made it much easier to install and coordinate with the case sealing machinery it adjoins and serves.

UNIT PACKAGING EQUIPMENT

THE LOWEST COST METHOD FOR INDUSTRIAL AND SMALL PARTS PACKAGING

formed, filled and sealed

THE FULLY AUTOMATIC **MODEL '500'** **COLD-SEALS SELF-ADHERING KRAFT PAPER PACKAGES**

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- Simple and complete adjustability, limited only by the overall size range of the equipment.
- Available with Code Printer for product identification.

in one continuous high speed motion!

write for literature and specifications

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For more information circle No. 240 on Card

U.S.I. POLYETHYLENE NEWS

A series for plastics and packaging executives by the makers of PETROTHENE® polyethylene resins

Packaging Notes

Sealed Polyethylene Box Liners for apples have been found to eliminate weight loss, retard ripening and reduce scald of apples held in cold storage. Sealed liners were found to be superior to coated paperboard liners and unsealed liners for most varieties of apples tested. Research showed, however, that quality and uniformity of the film used played an important part in its effectiveness in lengthening apple storage life.

Poly Film to be Featured at National Packaging Exposition in New York, May 26-30. U.S.I. will introduce at the show a new polyethylene film of unprecedented clarity. The broad range of PETROTHENE polyethylene resins expressly developed by U.S.I. for packaging applications will also be demonstrated.

The show, sponsored by the American Management Association, is expected to attract more than 40,000 visitors. Exhibits will feature the latest in packaging machinery, materials and design. Technical sessions will also be held.

Theme of the U.S.I. exhibit at the show will be "PETROTHENE Polyethylene for clear, tough, protective film." U.S.I. Technical Service engineers will be on hand to answer questions on film processing and applications. Packagers and others interested in using polyethylene film can see extraordinary film clarity and toughness demonstrated at the U.S.I. exhibit. (Booth nos. 221, 225, 322 and 326 on the fourth floor of the N. Y. Coliseum.)

New York Coliseum, site of the 27th Annual National Exposition at which U.S.I. will introduce film made from its new high clarity polyethylene.

New Heat Seal Booklet discusses the factors involved in obtaining satisfactory heat seals on polyethylene film. The 16 page booklet is illustrated with 40 graphs showing how time, temperature, melt index, slip agents and resin density affect heat sealing. Heat seal characteristics are given for various resins in U.S.I.'s PETROTHENE polyethylene resin series. Copies of the booklet are available without charge to extruders, convertors and packagers. Write to U.S.I. for "Heat Seal Characteristics of Polyethylene Film."

New U.S.I. Plant Will Produce 75,000,000 lbs. of Polyethylene a Year

Houston Facility Scheduled for Completion Next Winter

A second plant to produce U.S.I. PETROTHENE® polyethylene is scheduled to go on stream next winter in Houston. Capacity of the plant—75,000,000 pounds per year of intermediate density polyethylene resins—will almost double U.S.I.'s present polyethylene capacity. The plant at Tuscola, Ill., now has a 100,000,000 pound-per-year capacity.

Site for the new plant was selected to meet two prime considerations—easily accessible transportation for fast customer service, and a dependable supply of quality raw materials.

The 200 acre site on the Houston Ship Canal provides both. Shipments will be made by rail and truck, with the port facilities of Houston available for export orders. High purity ethylene will be piped in from nearby existing facilities of The Phillips Petroleum Company. Phillips will also supply the natural gas requirements of the plant.

The new installation will use a modification of the conventional high-pressure process, already proved in the Tuscola plant. Intermediate density resins will be produced, with properties somewhere between those of the original polyethylene resins and the new high-density resins produced by low-pressure processes.

PETROTHENE polyethylene plant at Tuscola, Ill.

National Petro-Chemicals is presently the third largest polyethylene producer in the United States. Petro has quadrupled PETROTHENE capacity in the past three years.

U.S.I. Assumes Full Control of National Petro-Chemicals

Full stock ownership of National Petro-Chemicals Corporation, producer of PETROTHENE polyethylene resins, has been acquired by U.S.I.'s parent company, National Distillers and Chemical Corp., from Panhandle Eastern Pipeline Company.

National Petro-Chemicals has been majority owned and managed by U.S.I. since its founding.

Saran-Coated Polyethylene Film Offers Improved Clarity, Lower Permeability

A recent evaluation of saran-coated polyethylene film indicates that as little as 0.1 mil of saran coated or laminated to polyethylene film improves clarity of the film and increases its impermeability to oils, organic liquids and gases.

This latter property, especially, promises to open up new packaging applications to coated polyethylene film. It permits the packaging of such foods as processed meats and cheeses in either a vacuum or inert gases, and helps retard oxygen-caused rancidity and discoloration in packages containing fats, oils, dried whole milk and many other products. Reduced permeability to organic liquids and vapors would enable the film to increase the shelf life of pharmaceutical products and also furnish better protection against off-taste and contamination.

The tests showed that good results can be had with saran-coated polyethylene bottles and collapsible tubes.

U.S.I. INDUSTRIAL CHEMICALS CO.
Division of National Distillers and Chemical Corp.
99 Park Avenue, New York 16, N. Y.
Branches in principal cities

Duane O. Culligan was graduated from the University of Illinois with a B.S. degree in mechanical engineering. Now administrative engineer with the Florence Stove Company, he joined the organization in 1951 and has been in its product engineering department for six years. Prior to his present association, Mr. Culligan was with the Ordnance Ammunition Center of the United States Army for about 16 months during which time he was a project engineer engaged in a mechanization program. He is a member of the packaging division of the American Management Association.

How packaging information flows through a manufacturing organization

By Duane O. Culligan,
Administrative Engineer,
Florence Stove Company,
Kankakee, Illinois

Hundreds of different packaging components which must be changed from year to year can present numerous problems. In his description of a well-integrated organization, Mr. Culligan tells why it is only a matter of routine that his company is able to move completely packaged gas ranges off its production lines with ease. He explains the precise specifications which flow among the various departments responsible for certain aspects of the over-all packaging function, what the responsibilities of each department are, and how they are all coordinated to produce the final, detailed specifications. Of special interest are the function and use of the parts lists and the packing specifications on the packaging lines. All of these go together to result in a smooth, highly efficient packaging operation.

For several years now, manufacturers of gas ranges have concentrated on the problem of stepping up current demands for their products. A gas range has very few moving parts and, if given reasonable care, will continue to do an efficient job of cooking for many times the life of the family automobile.

Thus, in an attempt to solve this problem, the industry has taken a page from the book of the automobile manufacturers. Instead of having four or five basic models which will satisfy the funadmental needs of the majority of homemakers, it is now common practice to produce hundreds of different units designed to appeal to the whims of every individual. Obviously, this complicates our packaging operations and emphasizes the need of a smooth flow of packaging data.

In our plant last year, we had approximately 250 different model designations. While there were only about ten different basic sizes of packages, the method of packing the interiors varied for each model. This was due to there being many different, yet interchangeable, component parts and features making up a complete unit. Again, like the automobile industry, there is a complete model changeover from year to year.

Departmental Integration

How all this affects our problem of packaging may be better understood when one realizes that there are seven departments within our organization vitally concerned with the packaging function. These departments are:

1. Product engineering
2. Industrial engineering
3. Purchasing
4. Inspection
5. Accounting
6. Production control
7. Assembly

The product engineering department is responsible for designing the package components and for specifying the exact manner in which the finished product is to be packed when it leaves the plant. Industrial engineering has the responsibility of providing the necessary equipment required to accomplish the packaging operations. It must also establish methods, make necessary work layouts, and set rates on each operation.

Checking on materials. The purchasing department must, of course, obtain the packaging materials which are to be used in production. Our inspection department maintains a close check on all materials received to be certain they are in accordance with specifications and further, that the completed unit is packed in the exact manner as specified by product engineering. All standard costs of the material and labor involved on the packaging lines are established by the accounting personnel.

Integration of these various departments and their responsibilities in regard to the packaging function are illustrated schematically in Fig. 1. It shows how the specifications as established by product engineering flow through our company.

It is possible that some might question the advisability of having product engineering responsible for establishing packaging specifications, and certainly an entire article could be devoted to discussing the pro's and con's of this question. Let it suffice to say that in our organization, we find this to be a very workable arrangement. The one thing which has become apparent as our product line has grown, is that in order for this to be a sound working pattern, there must be full and completely detailed specifications covering every phase of the packaging function.

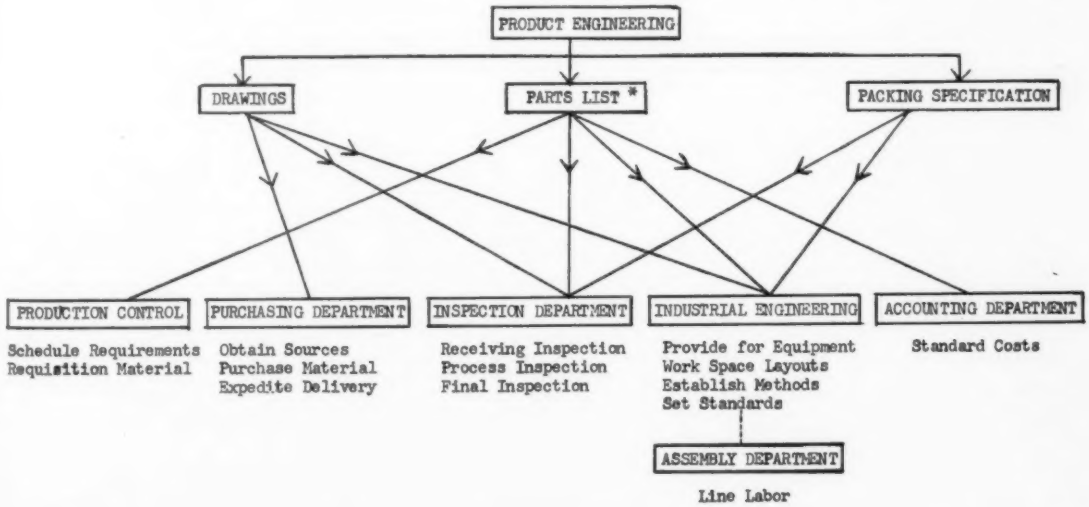
Specification Development

In order to best illustrate the exact form in which these specifications are developed, let us follow the chronological sequence of their development starting with the inception of a new model designation. The process is triggered by the product engineer when he issues what we term a "new model report." This gives the people concerned a general description of the product with respect to size, basic construction features, esthetics, and special performance features. In addition, it lists the estimated quantities to be produced and the desired date for starting production.

With this information at hand, the packaging engineer commences to work on the design of the package for the product. Generally, with the help of the model shop, it is possible for him to obtain a complete sample of the new product. There are occasions, however, when the bulk of the initial package design work must be based on information obtained from engineering drawings of the component parts of the range. In any event, the packaging engineer decides on the best method to pack the unit and proceeds to make up sketches of the various components of packaging material to be used, such as die-cuts, scored fillers, build-ups, etc. Samples of the packaging components are then made and tested prior to preparing the actual engineering drawings that are to be used ultimately as a basis for purchasing.

What appears on drawing. The accompanying illustration (Fig. 2) is a typical example of what we term a "carton complete." On a drawing of this type, we show all the components which can normally be purchased from one source and which can be used on a specific product or group of products. Inasmuch as we often purchase the same group of components from more than one supplier, it is absolutely necessary that we specify the exact manner in which the individual components are to be fabricated.

On this drawing, we cover every detail needed to make it a complete purchasing specification. In addition to showing minimum bursting strength of the corrugated board to be used for each component,



* PACKAGING ENGINEER SUPPLIES ONLY THE INFORMATION PERTAINING TO PACKAGING MATERIAL THAT APPEARS ON THE FINAL PRODUCTION PARTS LIST.

Fig. 1. Organization of seven departments vitally concerned with the packaging function. Good integration of these departments results in a smooth flow of packaging information through the company.

Labeling Lines

by George L. N. Meyer, Jr.

LABELING STANDARDS

LABELING STANDARDS

Setting and maintaining standards is of great importance in labeling machine operations. This practice can, and will, save your company substantial sums of money. Those labeling operations which are not based on a standard are often plagued by unnecessary "downtime" . . . resulting in both loss of production and loss of money.

HOW?

There are four areas which must be clearly defined when setting up standards in your labeling operation; the glass, the label, the glue, the machine.

GLASS

The ideal start requires an accurate drawing of each glass container which should be obtained from your supplier. Even if you purchase a "stock" bottle, ask for a drawing so that you may establish a standard for that particular bottle.

With this drawing you can specify the area on which the label is to be applied. The drawing will also permit you to check the contour of the bottle in the labeling area so that you can "locate" the label. By doing this, you can be sure straight sides will be obtained and that the label application will be perfect. You will also be able to specify fill height and if a variance is noted you can logically assume that the bottle is not up to standard.

In short . . . the first requisite for labeling success is consistent glass. If you fail to establish standards you will frequently overlook one of the most important and most elusive variables on the production line.

LABELS

Decide on label sizes and shapes *and* set exact standards or tolerances for each label. You will find label suppliers are able to hold closer tolerance on die-cut labels than on guillotine-cut labels. Generally speaking, suppliers will make every effort to conform to your specifications.

Here's a "tip"—Make sure your labels are *cut printed side up* so that the shearing or cutting action of the knife or die causes the label to curl in the direction of the wrap. If you're using die-cut labels, and a multiple die is used, ask your supplier to package the output from each die in its own box. Then . . . even if the dies vary slightly, you'll know that all the labels in any particular box have come from the same die. The labeler can be adjusted for any variance when a new box is opened.

Remember too, that when dies are resharpened your label size will increase to some degree. Metal is removed in the sharpening operation and the die will grow in size. Set a die-cut standard and you'll eliminate another cause of downtime or constant machine adjustment. Incidentally, ask your printer to insert cardboards top and bottom of the label sheets when he uses a guillotine cutter . . this helps the labels to stack in a perfectly flat fashion.

COMPOSITE

On your glass standard drawing incorporate an *accurate* outline of the label or labels to be used in their exact location. Mark in the dimensions, on this composite, most carefully. You now have a "standard" for two of the variables mentioned earlier; glass and labels. Adhesives will be discussed in a forthcoming "Labeling Lines."

Variations in glass, labels, or glue can play havoc with a high speed labeler, no matter how carefully your machine is engineered. More . . . your "standards" can be used to excellent advantage by your labeling machinery manufacturer to be certain your equipment is properly adjusted before it's shipped.

World's Largest Manufacturer of high-speed Labeling Machinery

WORLD LABELERS

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we show type and direction of flutes, basis weight of the liners (when critical), exact scoring dimensions and cutting sizes, along with the allowable tolerance on each dimension. If die-cuts are involved, we show all dimensions necessary to make up the die-cut board.

Thus, by giving our suppliers a detailed drawing specification of this type, we are able to mix like components from different vendors and use them interchangeably in production. Experience has shown us that this ability to interchange different suppliers' like components is most essential in order to maintain harmony within the incentive groups on the production lines. This drawing specification is also used by our receiving inspection department for definitely determining which components are acceptable for use in production and which ones should be rejected.

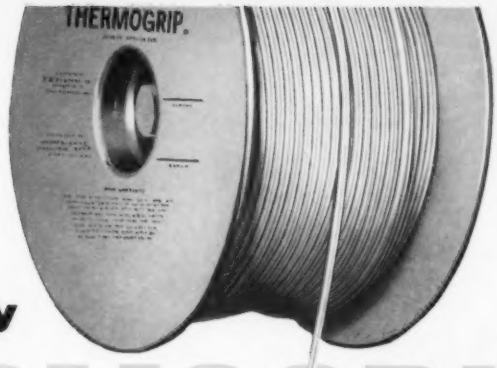
Possible Revisions

Upon completion of this drawing, prints are made and stamped "for estimate only," and forwarded to the purchasing department. It, in turn, sends them out to our suppliers for quotation and, at the same time, requests that one supplier furnish one complete set of handmade components for use by the packaging engineer. This procedure enables the purchasing department to obtain comparative prices from our various sources who are all quoting on the same basis.

Also, the suppliers are given a chance to check over the specification and question any details that are not clear to them. At the same time, they are encouraged to make any suggestions that they may have for material substitutions or design revisions which would be to our mutual benefit. Finally, the complete handmade sample is supplied. It enables the packaging engineer to make a final check for fit and performance, and to determine if the drawing has been properly interpreted by the suppliers.

Handle like engineering drawing. The next step taken by the pack-

10 Applications prove superiority of THERMOGRIP® Adhesive



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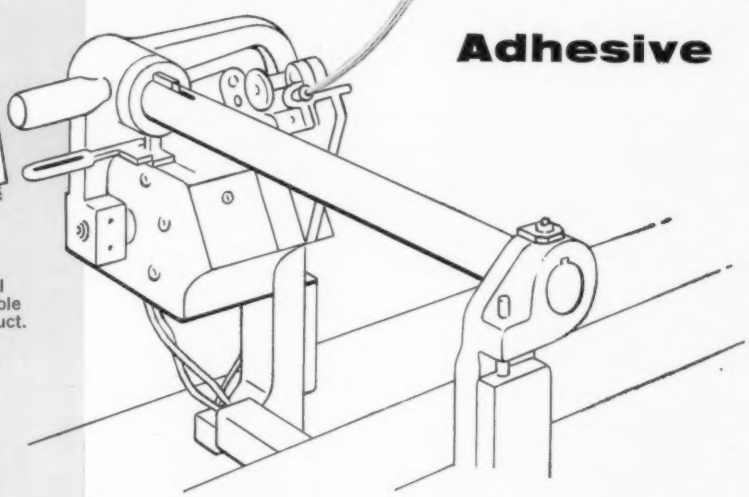
3. Quick set increased production 50% on 3 ply pasted bottom potato bag.
4. Side seam leaks eliminated on flour bags.
5. Waterproof seam at higher speed on 2 ply wet strength potato bags.
6. Cheaper and stronger side seams in polycoated multiwall bags.
7. High speed adhesive bonding of 2 mil polyethylene film for bags.
8. Better bond at higher speed of polyethylene film to laminated polyethylene for 2 ply bag side seam.
9. Paper to metal strip in continuous operation.
10. Quick stick, high speed bonding of foil to kraft for increased merchandising value.



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THERMOGRIP Adhesive sets instantly. Cuts running time. On some jobs, you can save a whole operation or special handling. THERMOGRIP is a new idea you might well explore. See if you can use it. We'll estimate your time savings and speed increases. Write for a copy of our FREE THERMOGRIP Production analysis today.

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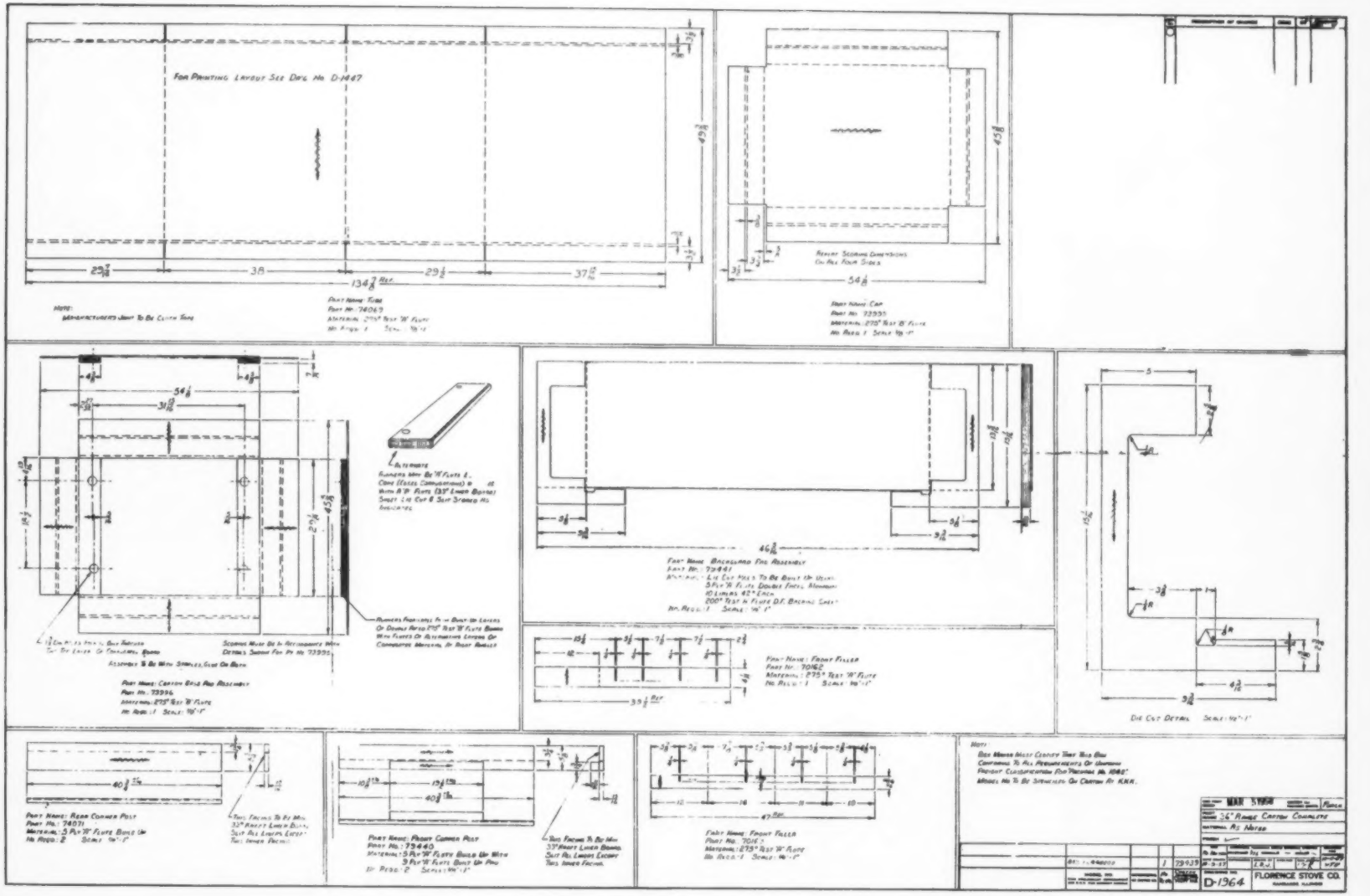

Fig. 2. A detailed drawing specification of one package. Termed a "carton complete," it specifies the exact manner in which the individual components are to be fabricated.

aging engineer is to set up the packing specification which covers the essential details of how the completed unit is to be packed when it leaves the packaging group. (See Fig. 3) Again, this is handled in the same manner as any engineering drawing. There is a special factory distribution so that all concerned parties will receive the information.

Note that at the top of the packing specification, we make reference to the "carton complete" and the auxiliary cartons used in conjunction with this particular specification. The remainder of the specification spells out the details of how the unit is to be packed.

A point to be stressed here is that we do not attempt to prescribe *methods* or *how* the actual work is to be accomplished, but only *what* is to be accomplished. In one sense, it might well be considered a performance specification. It remains for the standards and methods people of the industrial engineering group to establish *how, in what sequence,* and *where* the packaging operations are actually performed on the production lines.

In preparing this specification, we also think in terms of providing the information necessary for the final inspection department to determine if the work has been done as was intended by the packaging engineer.

With regard to the detailed information contained in the packing specification, it will be noted that under the heading, "auxiliary parts in carton," we indicate the position of each part in the carton with respect to all the other parts. We also specify the type and amount of flexible packing material to be used to assure adequate protection for finished surfaces. Under the heading of "tape," we spell out the exact number and size of pieces to be used, and the purpose that each piece is intended to serve.

The same is true of the individual pieces of cushioning material and wire. They are referred to under their respective headings. Finally, we cover any miscellaneous details

it specifies the exact manner in which the individual components are to be fabricated.

Hot Melt Glu-Pac

seals tight
eliminates overwrapping

FIBRE TEARING ADHESION
MINUS 30° TO PLUS 160°
FOR DEEP FREEZE PACK

Automatically sets up, inserts and seals.
Hot glue seal eliminates overwrapping.
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¾ H.P. Cooling Unit with recirculating coolant.
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FIXED Carton Sizes: ¾ x 2 x 4¾ to 2¾ x 7½ x 9½
Fully adjustable machines with 20 to 30 minute carton change available. *Literature on request.*

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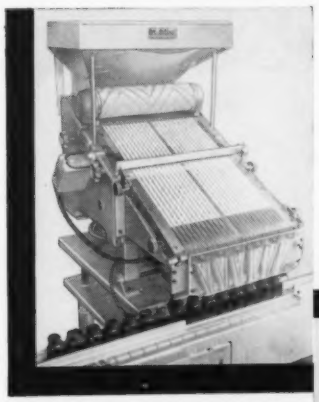

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- For compressed tablets and gelatin capsules
- Fills up to 100 bottles of 100's per min. Other models up to 300 bottles per min.
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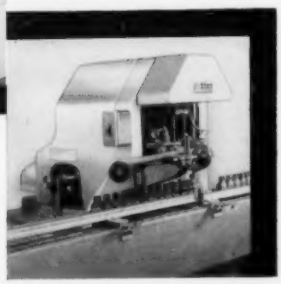
- Floor space only 27" x 42". Height 56"
- No. 53 Conveyor optional



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- Extremely flexible to handle wide range of bottles and cotton.

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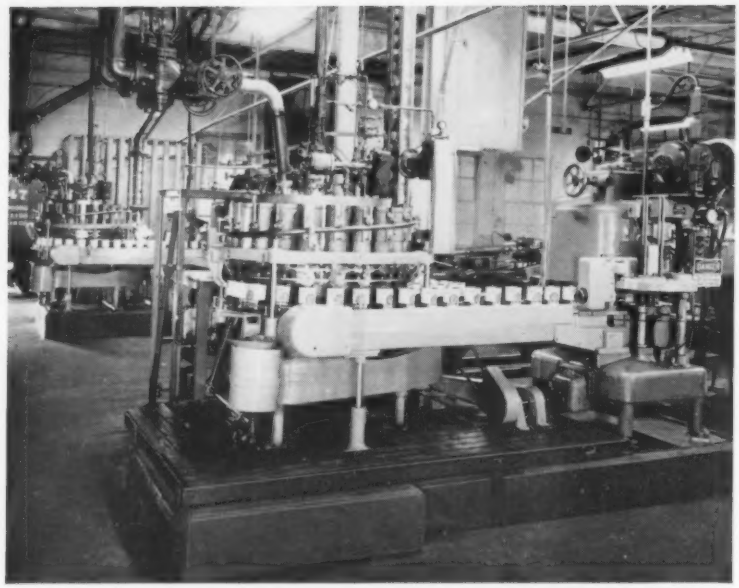


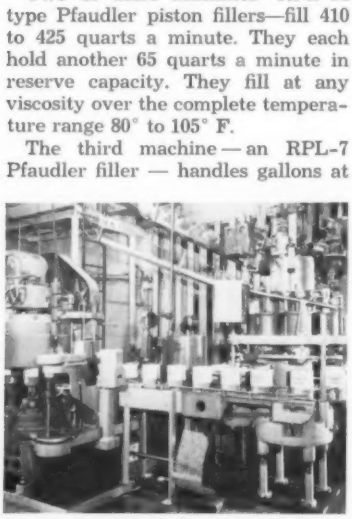
425 quarts a minute filled on this 21-station lube filler at Texaco plant. A total of three Pfaudler fillers handle all lube packaging requirements of the Port Arthur plant.

Filling without spilling at Texaco to 99.9969% accuracy

Texaco uses just three machines at its Port Arthur plant to fill a complete line of motor oils, hydromatic fluids, and antifreeze in quarts and gallons.

Two of these machines—RPL-21 type Pfaudler piston fillers—fill 410 to 425 quarts a minute. They each hold another 65 quarts a minute in reserve capacity. They fill at any viscosity over the complete temperature range 80° to 105° F.

The third machine — an RPL-7 Pfaudler filler — handles gallons at 60 to 80 per minute.



All three machines are accurate to ±0.1 ounce by liquid volume. They eliminate spillage completely . . . send cans from the plant with labels and cartons *clean*. No maintenance is required beyond routine cleaning.

There are only three primary wearing parts on these Pfaudler fillers: piston and valve rollers and valve trip cams. All are inexpensive and easy to replace. There are no connecting rods or wrist pins to cause trouble.

Simple, positive adjustments of the can support rails eliminate product spillage by compensating for the centrifugal forces generated during high-speed filling. An accelerating infeed screw pushes cans in uniformly without jamming.

Cleaning is easy, too. You empty the bowl through a drain port, flush with kerosene, put the machine through a few revolutions, and it's clean.

For more information, write for Bulletin 878, RPL Oil Fillers.

PACKAGE EQUIPMENT by PFAUDLER

a division of **PFAUDLER PERMUTIT INC., Dept. PE-58, Rochester 3, N.Y.**

such as, in this case, the broiler pan and grid to be packed in place in the broiler drawer; the use of the special pads that are to be used to hold the griddle burners and radiants in place.

Put All Information Together

The final step in the preparation of the complete set of specifications consists of tying together all of the information pertaining to packaging materials on the production parts list. Again, this list is released by the product engineering department, and it becomes the final authority for other departments charged with ordering parts, scheduling production, etc. It is also used as a source for much of the information needed to arrive at final costs of a given product.

Therefore, it is essential that all materials going into the manufacture of the finished product be included on the parts list. Excerpts from a typical list are shown in Fig. 4. Note that it shows all packaging components *and* product components. (The items listed therein which are used in the packing operation have been starred for purposes of illustration).

Listing the items. On the first page of every parts list (Fig. 4), we make reference to the packing specification that pertains to the particular product. Then, in the approximate sequence in which they are used in assembling the unit, each individual piece is listed with its part number, drawing number, finish, and manufacturing classification.

We also indicate by the position of the part name within the "nomenclature" column whether the piece goes on the main assembly line or into a sub-assembly. For example, in Fig. 4, note that the carton "base-pad assembly" is listed as the *first* item to be used. This is indicated by the fact that it is shown first on the list. Also, this same item is shown with the first word, "base," commencing in the first narrow vertical column within the large "nomenclature" column. This indicates that it is to be used

PACKING SPECIFICATION NO. 60

SUBJECT: 1958 - 36" Florence Gas Range w/Top of the Range Rotisserie

CARTON COMPLETE		AUXILIARY PARTS CARTON		BACKGUARD CARTON-OR PAD	
DRWG. NO.	PART NO.	DRWG. NO.	PART NO.	DRWG. NO.	PART NO.
D-1964	79439	B-3318	78710	None	None

INSTRUCTIONS:

AUXILIARY PARTS IN CARTON:
- a. Top Grates nested back to back, with Owner's Literature in between along side of Carton.
- b. One sheet of Single Faced (10" x 18") on Grates.
- c. Aeration Pans wrapped (2 sheets) and nested face down on Single Faced.
- d. Burner Trays wrapped (2 sheets) end for end beside Grates.
- e. Rotisserie Racks with tie bars up and opposite each other on Burner Trays.
- f. Spears and Skewers on Rotisserie Racks.
- g. Spit Supports placed between tie bars on Rotisserie Racks.
- h. Thermometer Spit wrapped (2 sheets) with paper wadded around Dial and Crystal, Slanting across Broiler Rack Guides with Dial in corner of Carton.
- i. Flash and Housing Tubes wrapped (1 sheet) on Spit Supports.
- j. Griddle Grease Pan wrapped (1 sheet) face down at end of Carton opposite Spit Handle across Rotisserie Racks.
- k. Oven Rack Guides end for end with tie bars down on Aeration Pans.
- l. Oven Racks on above parts.
- m. Griddle Plate wrapped (2 sheets) face down on oven racks.

TAPE AS FOLLOWS: (1/2" Pt. No. 69801)
- a. One piece (1/2" x 10") - Governess Burner Head to Burner Base.
- b. Two pieces (1/2" x 6") - Backguard Glass or Panel to Glass Channel.

Total Length - 1/2" = 22"

SHOCKSORB AS FOLLOWS: (Pt. No. 24300)
- a. One piece (24" long) - Between Front edge of Oven Bottom and Front Frame.
- b. One piece (24" long) - Between Oven Door Lining and Front Frame.
- c. One piece (18" long) - Between Broiler Door Lining and Front Frame, across top and down right edge.
- d. One piece (16" long) - Between Top and Upper Right Corner of Compartment Panel and Front Frame.
- e. One piece (8" long) - Between Lower Right edge of Compartment Panel and Front Frame.
- f. Two pieces (18" long) - Between Front and Rear edges and around corners of Rotisserie Pan and Main Top.
- g. Two pieces (18" long) - Between Front & Rear edges of Grid Top Cover and Rotisserie Pan and Main Top (to be layed across Rotisserie Pan and Main Top and Griddle Cover Forced down into position).

Total Length = 162"

WIRE AS FOLLOWS:
- a. Two pieces (16 Ga. x 11" long) - Oven Burner Clamping Plates to Burner Supports.
- b. Four pieces (20 Ga. x 8" long) - Top Burner Brackets to Burner Supports (1 piece each Burner).

BROILER COMPARTMENT:
- a. Broiler Pan & Grid wrapped (2 sheets) right side up on bottom of Broiler Drawer.

GRIDDLE BURNERS:
- a. Force Burners Pads (Pt. No. 78574, Drwg. No. A-6081) Between Main Top and Griddle Burner. This Pad holds both Burner and Radiant down in place (Both Burners).

NO. | BY: DATE | RELEASED: DATE:

REVISIONS:

PACKING SPECIFICATION NO. 60

PREPARED BY: Lyman D. Just

DATE: 9-5-57

RELEASED:

FLORENCE STOVE COMPANY
KANKAKEE, ILLINOIS

DRAWING NO. A-6130

DATE: 9/9/57

Fig. 3. The packing specification which covers the essential details of how the completed unit is to be packed when it leaves the packaging group.

(Turn Page)

PACKAGING PERFECTION

beyond measure

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There's a difference between NB packages and others you can buy. Sometimes you can't see this difference — or even measure it. But when you put NB packages to work, their finer qualities become something you can measure in dollars and cents of extra sales. Fine base materials, craftsmanship treatment of these materials, and only top-quality standards of manufacture are the basis of this extra performance. And, beyond this, is an unmatched experience in fine package making.

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Long Island City 1, N. Y.
RAvenswood 8-0909

PARTS BY J.M. DATE 10-7-57
CHECKED BY ____ DATE ____

PARTS LIST

PAGE NO. 1
TOTAL PAGES ____

MODEL NO. 1-847500

36" Deluxe Rotisserie Top Gas Range

F-1827 3M 10-57 F.P. RELEASED: MATERIAL ORDERING & SCHEDULE 10-7-57 PRODUCTION

REVISIONS | BY

	DRAWING NUMBER	PIECE NUMBER	NO. REQ'D	NOMENCLATURE	MATERIAL & FINISH
	C-2877	Ref.Only -		Index to KKK Shop Instructions	
	B-3522	Ref.Only -		Index to KKK Wiring Diagram	
*	A-6130	Ref.Only -		Packing Specifications #60	
*	D-1964	73996	1	Base Pad Assembly (Kit #79439)	Pur.
		79363	1	Oven Lining Assembly Right Complete	
	E-175	79364	1	Oven Back Lining Assembly	GrayPorc.
	E-175	79365	1	Oven Back Lining Assembly	
	E-175	73078	1	Oven Back Lining	
		79401	1	Auxiliary Parts in Carton	
*	B-3318	78710	1	R.S. Carton (19 1/4 x 16 1/8 x 6)	Pur.
	D-1174	73255	2	Aeration Pan (Fab. #79022)	WhtPorc.
	C-2459	68728	2	Top Burner Tray Complete	Grd.Ct.
	C-2459	68729	2	Top Burner Tray	
	A-4700	68730	2	Top Burner Tray Front	
	D-1866	78533	2	Oven Rack (Deluxe Chrome)	Pur.
	C-2411	68657	2	Oven Rack Guide	Pur.
*			10	Newspaper	
*		71226	1	Single Faced Corrugated Paper (10 x 18)	Pur.
*	A-5121	72292	4	Staples (1 3/8" Long)	Pur.

PARTS BY J.M. DATE 10-7-57
CHECKED BY ____ DATE ____

PARTS LIST

PAGE NO. 25
TOTAL PAGES ____

MODEL NO. 847500

36" Deluxe Rotisserie Top Gas Range

F-1827 3M 10-57 F.P. RELEASED: MATERIAL ORDERING & SCHEDULE ____ PRODUCTION ____

REVISIONS | BY

	DRAWING NUMBER	PIECE NUMBER	NO. REQ'D	NOMENCLATURE	MATERIAL & FINISH
*		1147	2	Wire (16 Ga. x 11") (Blk. Annealed)	Pur.
*		1127	4	Wire (20 Ga. x 8") (Blk. Annealed)	Pur.
*	A-6081	78574	2	Burner Pads	Pur.
*		24300	1	Shoksorb Paper 3" Wide (See Pack. Specs.)	Pur.
*		69801	1	Tape (Minn.Mining Type 880)(1/2" Wide)(See Pack.Specs.)	Pur.
*		67484	1	Tape (Minn.Mining Type 880)(3/4" Wide)(See Pack.Specs)	Pur.
*	D-1964	74069	1	Tube (Kit #79439)	Pur.
*	D-1964	73995	1	Top Cap (Kit #79439)	Pur.
*	D-1964	79440	2	Front Corner Post (Kit #79439)	Pur.
*	D-1964	74071	2	Rear Corner Post (Kit #79439)	Pur.
*	D-1964	70162	1	Front Filler (Kit #79439)	Pur.
*	D-1964	70163	1	Front Filler (Kit #79439)	Pur.
*	A-4842	70178	2	Griplock Strap (700# Knot)	Pur.

Fig. 4. Three excerpts from a typical parts list. Released by the product engineering department, this type list becomes the final authority for other departments charged with ordering parts, scheduling production, etc. It is also used as a source for much of the information needed to arrive at final costs of a given product. Note that it shows all packaging components and product components in the approximate sequence in which they are used in assembling the completely packaged unit on the production lines.
(*Indicates items of packaging for purposes of illustration)

on the main assembly line.

Similarly, note that the "R.S. carton," the "10 newspapers," the "single-faced corrugated board," and the "4 staples" are all listed with their first letters commencing in the second narrow vertical column within the large "nomenclature" column. This indicates that they are used in a sub-assembly operation to pack the auxiliary parts which go along with the completed unit. In other words, the sub-assembly operation, in which the various parts are to be used, is indicated by the narrow column in which the name of the part commences.

Finally, on the last page (or pages) of the parts list, we show the remaining items used in the packing operation. The packaging engineer usually confers with the standards and methods people in advance to determine the exact manner in which these various items should be listed.

At the time the parts list is actually released to other departments, so are the drawings for purchased components and the packaging specifications. Only after this formal "release" is the information contained therein considered official. This does not mean, however, that the packaging engineer is through with the item at this time. Actually the parts list and all the specifications are subject to changes as long as the item remains in production. When it becomes apparent that a change is necessary, it is issued on a regular engineering drawing change-notice form or in the form of a parts list change notice.

Specification Changes

Actually, there are several areas from which we may obtain information which will lead to a specification change. For instance, the supplier may find that due to changes in moisture content during processing, it is impossible to hold certain specified dimensional tolerances. On the other hand, we may find that some of the design dimensions must be changed due to an accumulation of manufacturing tolerances on the product. (*Turn Page*)

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FILLER SEALER EJECTOR
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1. Fills, seals, ejects in continuously indexing automatic operation.
2. Handles any tube that can be heat sealed, standard and heavy wall, with equal efficiency.
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   Twin: up to 120 tubes per min. 1" x 7⅞" max.
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It is our practice to run National Safe Transit tests periodically on the packaged product as long as it is in production. This is done primarily as a quality control check on the product. However, these tests may show up a pattern of damage that did not occur on the sample used originally in the design stage. If it is something that can best be corrected by a change in packaging, the change will be made.

Finally, close liaison is maintained with our dealers and distributors, and any patterns of damage that show up in the field are investigated. As a result of such investigations, we make whatever changes are deemed necessary. The important thing about all changes is that they must clear through the packaging engineer and be incorporated as a revision or change into the original specification. No one else in the organization has the authority to deviate from the formal specifications covering the packing of a given product.

Personal Contact

While we feel that it is essential to have formal specifications as explained above, they do not eliminate the need for personal contact and liaison among all departments concerned. In the case of new packages, quite different from anything used in the past, it is common practice to furnish an actual sample of the packaged product to the standards and methods people for analysis. This enables them to have a more accurate picture of how the various items of packaging material are to be used. At that time, they have an opportunity to come back to the packaging engineer with comments and suggestions for changes which will enable them to achieve better balance between stations on the packaging line.

Beyond that, the packaging engineer usually goes over the first production samples with the inspection department personnel to see that all specifications have been properly interpreted. After that, it is a matter of routine for him to make periodic visits to the various packaging lines to check with the area supervisors and group leaders. By so doing, he keeps abreast of current practices and procedures, and is able to spot troublesome operations. He also receives first-hand comments from operating personnel. All these may very well be of value in his thinking with regard to future designs.

Suppliers, too, can help

Personal contact and articulate communications with suppliers are important phases of the over-all work of correctly handling packaging information. Readers should remember Mr. Culligan's suggestions on letting suppliers have ample opportunity to see drawings and specifications—and to make timely suggestions. They often can recommend material substitutions or design revisions of distinct value in a given packaging project.

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August 2, 1957

King Sales and Engineering Company
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We use your Gluers for a variety of operations. The principal use is for gumming bag labels. They are also used for labeling certain carton cases, and for drums.

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TRUE PORTABILITY
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EASIEST CLEANING

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king SALES AND ENGINEERING CO.
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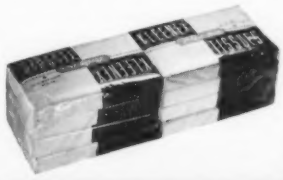
Step up sales, cut labor costs . . . bundle your packages on the OLIVER

Overwrapping groups of packages into attractive bundles naturally increases unit sales. Distributors and retailers find bundled paper specialties, drugs, food items and similar articles easy to stock and handle.

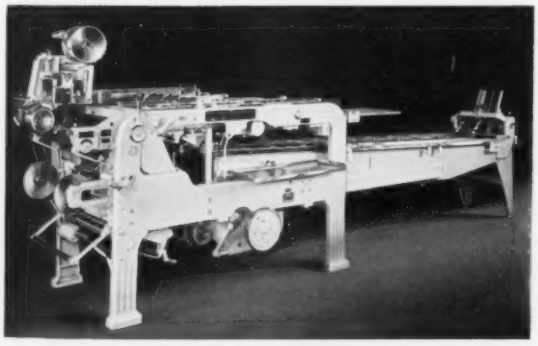
The recognized quick-adjustability of Oliver wrapping machines makes them ideal for bundling. You can switch from endfold to underfold at the flick of a finger. Change for package size in a minute or two. Even with short runs, down-time is low. And the unusual range of sizes handled by Oliver wrappers is another money-saving advantage.

The Curad and Kleenex bundles grew popular overnight. The Oliver overwraps and zip-tapes 12 Curad packages to the bundle. It overwraps 8 Kleenex packages. These eye-pleasing bundles are neat and strong.

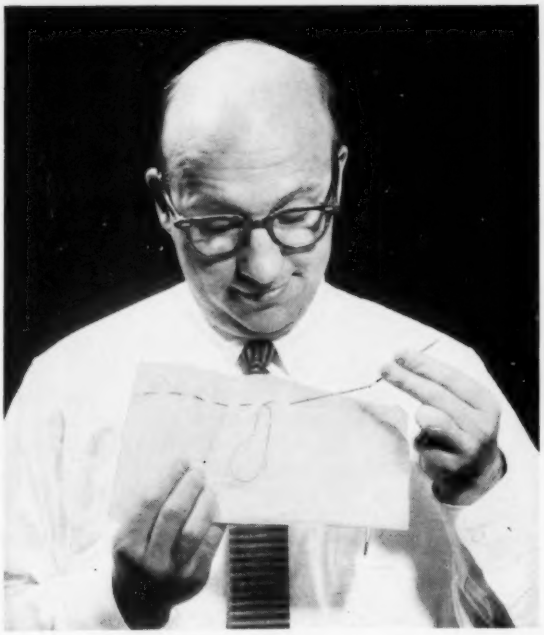


Get all the facts

Oliver engineers will help you decide the best way to bundle your packages. They will plan your line to synchronize the accumulating and feeding operations. Write for details.



Oliver PACKAGING DIVISION
MACHINERY COMPANY
445 6th, N. W., Grand Rapids 4, Michigan



Need a tissue you can *stitch?*

Here's a tissue that can be sewed like cloth —we can't list the many uses for it here. And this is just one example of the many special types of tissues developed by Crystal. Maybe you have a need for tissues that can be twisted and woven—or laminated to films and foils—or impregnated with chemicals. Whatever your particular requirements, chances are that Crystal has or can develop the special tissues you need.

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Packaging Institute conducts technical program at PM&ME

A searching look at the process of getting acceptable packaging machinery (from the determination of specific needs through testing and installation to establishing of service requirements), a thorough-going discussion of folding cartons standardization and problems of high speed, and a panoramic examination of current aspects of polyethylene usage highlighted the Special Technical Sessions held during the 1958 Packaging Machinery & Materials Exposition. Also, those present heard the Assistant Secretary of the Army (for financial management) discuss the problems of preserving the peace, listened to a chalk talk on a basic technical approach to packaging, and heard the editors of three packaging magazines discuss current and future problems and trends.

"In packaging there are no ultimates and no absolutes," John M. Cowan, National Flexible Packaging Association, declared when he opened the program of PI's special technical sessions. Pointing out that packaging is "a business of ideas," Mr. Cowan reminded his listeners of the ever-changing character of packaging and the constant appearance of new developments.

What About Polyethylene?

Discussing "adhesion promoters," Sam Gold, adhesive division, National Starch Products, Inc., opened the session, "Polyethylene . . . Promise or Performance". Adhesion promoters or primers contribute to good adhesion, lower extrusion temperature, and good heat seals, according to Mr. Gold, who added that using saran-coated cellophane, it is impossible to get good adhesion without a primer. He suggested using a primer on the seal area in order to make center seal bags. Pointing to low pressure polyethylene as a large area where much work needs to be done, he noted that it is more crystalline in nature than customary polyethylenes and predicted development of special primers.

"You still need the right combination to get high-speed packaging with polyethylene," Dr. L. E. Simerl, Olin Mathieson Chemical Corporation, told his audience. He predicted a boost in the usage of polyethylene from 375 to 450 million pounds—even with the presently available machinery.

"Large users want to do high-speed packaging with polyethylene," Ross A. Easter, Pillsbury Mills, Inc., asserted. A survey he conducted revealed that sealing is a serious problem. Improper design of change or conversion parts for present machines limit the use of polyethylene. Clarity and odor could be improved, he said. Further, he said, users need to know how to specify polyethylene for a given packaging use. "Polyethylene does not cover everything, and you need standards," Mr. Easter declared.

Weak spots of polyethylene include limpness or lack of stiffness, and surface drag, according to Charles Fields, Shellmar-Betner Div., Continental Can Co., Inc. Sealability is a major obstacle, he noted, suggesting that fuse seals requiring time and temperature control are the only dependable seals. "No one has figured out how to heat the surface without heating the inside of the film," he declared, as he pointed out that two-jaw sealing can drive the heat in from both sides. He predicted that use of a multiplicity of heated jaws to handle cut segments at high speed might be the answer to better sealing.

New Spec's Urged

"High density materials offer a completely different set of specifications from other materials," Henry Knoechel, Hayssen Manufacturing Co., told his audience. "You need good tolerance of gauge and good slip characteristics." However, there is far too much trial and error, according to Mr. Knoechel, who urged establishment of a board or panel to set up specifications. "There is always a period of indecision when a new material comes out and a long-lasting job would be proper development of suitable specifications," he observed.

"Polyethylene has yet to make in-roads in machinery-wrapped packages," P. M. Norwood, Bakelite Co., Div. of Union Carbide Corp., told those attending the technical sessions, noting that a current problem is the opening of well-sealed packages. He suggested peelable seals, tear tapes, and perforated film as possible ways of overcoming this problem. He predicted reliable, easy-to-open packages, using machine-wrapped polyethylene.

"There is a great amount of room left for voluminous film usage," Bruce Miller, Ludlow Papers, Inc., told his audience. Even with increased use of plastics, he suggested that the new unsupported films using new extrusion techniques offer opportunities for expansion of film usage. He said that commercialization of these films will provide new materials.

Cartons And High Speed

"Costs represent a tremendous driving force for standardization and high speed," W. L. Romney, The Procter & Gamble Co., asserted. He predicted much more attention to precision and uniformity, terming these "vital factors" of folding cartons for high-speed usage.

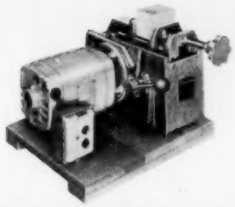
"While simplification represents a reduction of the number of sizes, standardization is an engineering

function," Howard W. J. Baines, E. R. Squibb & Sons, Div. of Olin Mathieson Chemical Corp., stated. Pointing to tightened up specifications and most statistical quality control, he declared that higher speeds demand uniformity of packages. Further, he asserted that cheap packages represent poor economy because they result in too many jams. He observed that simplification involves going to the smallest number of packages, and suggested as another goal complete interchangeability of standardized parts. "It is important to include in the specifications a list of the possible acceptable tolerances," Mr. Baines asserted.

Consider Board, Die

"Boxboard is the most important ingredient of a good carton," Richard F. Neff, The Lord Baltimore Press, told his audience. Mill tolerances remain the same as they were five or ten years ago, he observed: "There is still a five per cent plus or minus tolerance allowed. It is increasingly important to work toward the reduction of these tolerances". Absorbency of board on both surfaces also is increasingly important, he suggested, adding that a shorter dwell time is a factor deserving attention. "Don't ignore the mill and carton makers' experience in developing your specifications," Mr. Neff declared. In this connection, he pointed out that the manufacturer should watch the die much more closely in order to attain greater quality control in manufactured cartons.

Uniform quality of board, finish, die-cutting, prebreaking, and similar factors are extremely important to high-speed cartoning, Wickliffe Jones, R. A. Jones & Co., Inc., told those attending the Special Technical Sessions. "There has to be a fundamental re-engineering of machinery; beefed-up frames and double horsepower are increasingly important," Mr. Jones said. "Currently machines need strength and mass to absorb the vibration received as a result of sustained operation. Likewise, we are strengthen-



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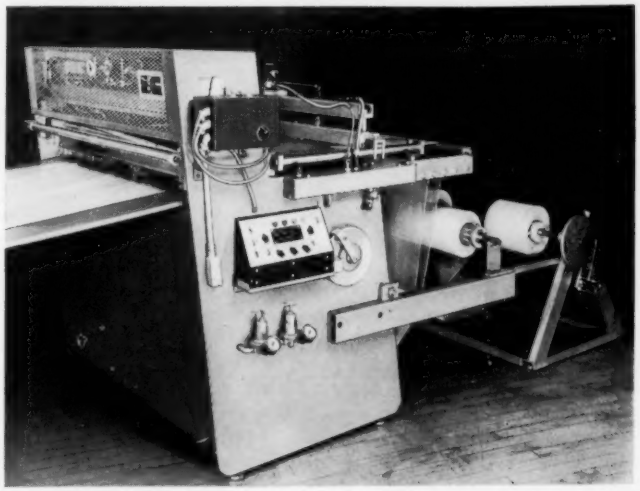

Dependable high speed operation by leading converters has proved the new "Airtronic" a distinct advancement in polyethylene bag making. Sizes up to 45" wide; up to 70" long (longer on special order). Up to 100 bags per minute (one up). With Multiple Roll Unwind Stand, up to 300 bags per minute. Variable speed drive. Handles seamless tubing up to 6 mil flat or up to 3 mil gusseted. Hole punching mechanism and electric eye optional.

MODERN ELECTRONIC CONTROLS and AIR OPERATION replace complex mechanical parts, reduce wear, cut maintenance, simplify operation and insure better bags faster, at lower cost.

PRECISION CONTROLLED heat, pressure and dwell time on *relaxed* film insure consistently tight bag seals. Sealing dwell is instantly adjustable—no loss of time for temperature change. It will pay you to know in how many ways the new Corley-Miller Airtronic machine can modernize your bag making production; so send for complete details without delay.

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AUTOMATIC PACKAGING

means lower costs and increased production!

Jack's Cookie Co., of Tampa, Florida, is saving "even more than anticipated" with their Hayssen equipment.

• From the oven to the shipping carton, Jack's Cookies are handled automatically by Hayssen. The oven conveyor feeds directly into the hopper of a Hayssen automatic "LIFT" elevator conveyor. Gently raised and discharged into the high level feed of the Hayssen "COMPAK," the cookies are weighed and bagged. The "COMPAK" forms the bag from roll film, with perfect electric eye registration of printed design, automatically fills and hermetically seals. Through Hayssen's quick, easy roll stock changing, Jack's is ready to package one variety after another in a matter of minutes.

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ing our power trains." He noted also that older practices are no longer in force; for example, extra gripping of gear teeth now is necessary, as is the reduction of effort by eliminating awkward, jerky motions. While gentle starts for high-speed units are now necessary, these machines cannot tolerate slow stops, according to Mr. Jones, as he noted that dynamic braking is imperative.

"Performance" Is Vital

"We are experiencing a tremendous increase in factual knowledge," Dr. Frank C. Campins, Polymer Industries, Inc., told those attending the sessions. Stressing the importance of the "structure of performance," he told his audience that "ultimately you are selling performance," and added that the importance of optimum compromises is overriding. It is necessary to remember that everything goes out of date, and that everything has a death certificate, as well as a birth certificate on it, according to Dr. Campins. "But above all, you build engineering science with an autopsy of failure. It is important to consider the 'heritage' concept," he added, observing that the fragment of unreliability is ever-present. He asserted that the parentage factor (such as defects in the end products) plays an increasingly important part. Today's optimum compromise—to live with it *now* and to operate *now*—represents the practical viewpoint to have, according to Dr. Campins, as he asserted that the goal should be useful and economic interrelationships.

Army's Keynote For Peace

Preserving the peace is the really important mission of the army today, George H. Roderick, Assistant Secretary of the Army (for financial management) told his audience. He stressed the importance of ground forces and traditional weapons. He warned the group of the importance of an army being prepared to fight limited actions with these traditional weapons and

Yes, Swift's Highspeed Resin Adhesive can cut the bottlenecks of packaging closure or labeling. They're made to keep pace with today's production requirements.

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systems, even though the more widely-publicized nuclear weapons are available. He suggested the possibility of limited actions occurring at various spots in the world, and of an army having to stamp out small conflicts an enemy might start.

Views Of The Editors

During a "Meet the Packaging Press" session, Lloyd Stouffer, *Modern Packaging*, warned his audience of the expected expansion of domestic and foreign markets for packaged items and stressed the importance of keeping abreast of machinery and material trends. Chris FitzGerald, *Packaging Parade*, reviewed basic problems of automation and reminded his audience to consider the human personal factors involved, as well as to remember the importance of treating operations in their entireties, rather than to isolate them. R. Bruce Holmgren, PACKAGE ENGINEERING, emphasized the importance of getting a properly interpreted program across to top management, and stressed both the technical and the coordinative values of specialized packaging activity as a background for a packaging man himself getting into top management. He also urged the importance of giving significance to one's work and to developing new yardsticks, including the reduction of vague standards to definite measurements.

Machinery: From Idea To Installation

Centralized responsibility for machine development and procurement in one project engineer was urged by Lowell Ledgett, Colgate-Palmolive Co. He said this individual should coordinate all details within and without a company. "There should be a single contact with machinery suppliers," Mr. Ledgett said.

"Choose the right equipment that will do the job," Edward Wixted, Schering Corp., warned his audience. He stressed the necessity of justifying a capital investment in less than three years and in attaining increased production at lower cost. All these, he said, help sell the program to management. He said his organization used both the direct labor savings and the out-of-pocket overhead savings to justify the cost of a new line.

"Packaging men need full knowledge of available sources," Fred Blumers, General Mills, Inc., asserted. He pointed out that people, publications, and visits contribute to getting this full knowledge. The "people" involved include equipment supplier representatives, those in one's own company, and suppliers of packaging materials. "We try to create a climate that brings new developments to our attention," Mr. Blumers noted, saying that they receive visitors cordially. He urged attention to manufacturers' catalogs and to the various periodicals concerned with packaging, and he emphasized the importance of collecting and filing information for immediate and future use. He suggested plant visits and stressed the

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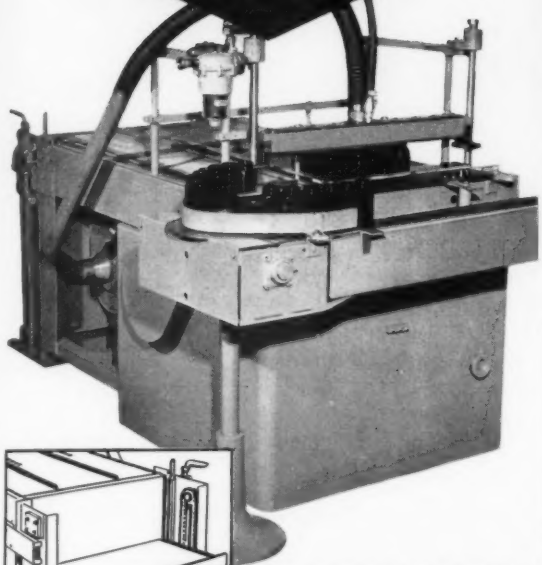
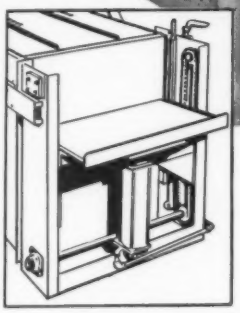
air-cleans wide mouth containers





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increases cleaning efficiency with heads specially designed for bottle size — gives quick changeover, accurate synchronization. Only one operator is necessary on this low-cost M-S machine which performs smoothly because it has fewer moving parts, fewer operations to air-clean bottles. Custom made to your requirements.

Air-operated platform with adjustable stops, for elevating multiple-tier cases.

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Performance Plus . . .
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Typical Arenco personalized service is the experience of Riker Laboratories in Los Angeles. Riker urgently needed an Arenco capping machine to implement production. To meet Riker time requirements Arenco delivered the equipment by air, non-stop from Denmark across the North Pole to Riker Laboratories in Los Angeles!
The unit "was delivered as scheduled", said a Riker Laboratories spokesman, "with a minimum of effort on our part, and we are most grateful to the Arenco Machine Company for their splendid cooperation in this matter."

GAB Automatic Tube Filling and Closing Machine

GAC Semi-Automatic Jar Filling Machine

The Arenco Machine Company has long been known by its customers for the outstanding performance of its quality machines and the personalized, interested, follow-through service it makes available to them.

VUV Bulk Materials Packager

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ARENCO
MACHINE COMPANY, INCORPORATED
25 West 43rd Street • New York 36, N. Y.
Manufacturers of filling, capping, sealing and packing machines.

value of Packaging Institute committee participation.

"Specifications must include all details from the user himself, as well as from his supplier," L. A. Curtis, Package Machinery Co., declared. He referred his audience to the Packaging Institute checklist and stressed the importance of knowing the electrical and lubrication safety features, special developments, and auxiliary equipment of a contemplated unit of machinery. He warned his audience of 'errors of commission:' "Long after the specifications have been written, the user's engineers arrive in the supplier's plant to redesign the machinery—not too long before its intended delivery." He acknowledged this is a human factor, but a "very serious" one.

Users Work Closely With Machinery Builders

"Our company takes an active part in machinery development and we follow our supplier's building program closely," R. F. Miller, Kraft Foods Co., pointed out. He urged the importance of adequate inspection and testing while equipment is still in a supplier's plant.

"There must be cooperation and meshing of research efforts between machinery builders, material suppliers, and package users," Charles Barr, F. B. Redington Co., declared. Pointing to great progress being made, he asserted that broader markets are now being created for the users. But to make the most of such productive machinery, there is "an absolute need" for supervised and prolonged testing under conditions simulating the user plant. "It is hard to persuade a user to furnish enough material for adequate testing," he said, noting that a supply of 30,000 cartons may give only 90 minutes of testing in the supplier's plant.

Inspection by the seller's representative after installation on the user's floor is important, according to Edward J. White, Warner-Chilcott Laboratories, Div. of Warner-Lambert Pharmaceutical Co., Inc. He urged the careful instructing of mechanics during such tests and cited the advantages of a user's mechanics working with the seller's representatives and learning the operation and lubrication of machinery—including the use of the supplier's manuals. His company finds the "tell-show-do" training of value. They also make effective use of the "buddy" system. In addition, they assign trained operators to work with new ones and make it a practice of establishing standards for machinery operation.

Spare Parts And Manuals

"A supplier should advise a user what parts to have on hand," Edward W. Love, Bristol-Myers Co., observed. Discussing spare parts kits, he urged distinguishing short life parts from major ones—the latter being those that seldom break down. At the same time, he stressed the importance of having entire assemblies, such as extra filling heads, ready for use. He urged his audience to have more parts on hand if a machine supplier is some distance away. Likewise, if a user has his own well-equipped repair shop, he needs fewer parts than otherwise would be the case. "A three- to six-month supply of parts in your plant should be on hand," Mr. Love pointed out, adding that a user should re-order before supplies are exhausted. While he suggested immediate delivery on short life standard parts, he urged his audience not to seek such delivery on one-of-a-kind machine parts.

Discussing the availability of manuals, Ira Gottscho, Adolph Gottscho, Inc., suggested that each machine is, in effect, custom-made and that problems arise with manuals. A user should accept the modified manual with a one-of-a-kind machine. He suggested that the manuals should include not only charts and diagrams, but also parts drawings and timing charts. He said that these charts would avert many service calls. Mr. Gottscho urged that some group make recommendations concerning manuals, including a list of whom to send them.

NEW...

LOW COST TWO LINE FILLER

TYPE 15 NH 2

Hope

- Simple adjustment for different height containers (no changing of nozzles)
- Rising table "bottom up fill"
- Diagonal filling saves space, easier handling
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- Accurate positioning
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- 15 to 30 cycles speed range
- For liquid, viscous or semi-viscous products
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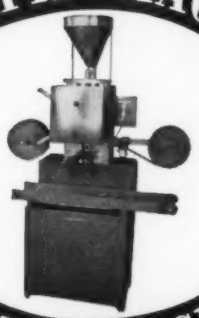

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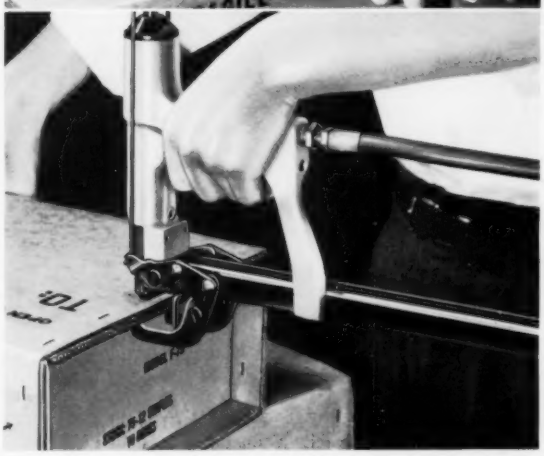
Senco simplifies



by making portable 3-pound fully pneumatic stapling pliers for recessed end packing, prepacking set-up boxes and display. Heavy and light wire models available.

result: VERY ADEQUATE PORTABLE ECONOMICAL BOX CLOSURE

FREE TRIALS - NO OBLIGATION

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your nearest Senco representative. Sales and service offices in all principal cities U.S.A. — Canada.

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Announcements of machinery and products

1. Beneath each announcement is a code number. As you select items on which you want more information, *note* this number.
2. Now, *circle* the corresponding numbers on the postcard, located inside back cover.
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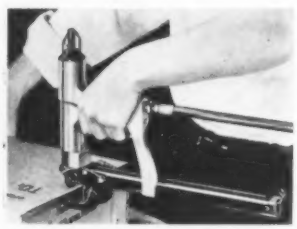
Corrugated Closing Method

Senco Products has developed a method of corrugated case sealing that makes a package with some unique features. End panels which are pressed against contents and



then stapled to body of case make a tight package in which contents are held firmly in place. End panels also give extra stacking strength and resistance to bursting if case is dropped. Circle No. 1.

High-Speed Bulk Packaging

J. L. Ferguson Co. has designed an automatic case feeder-former-positioner-loader as part of its Packomatic line. This machine loads 46-oz. cans into end-opening corrugated shipping containers at a rated capacity of 20 twelve-can cases/min. Fully automatic operation of this machine includes the following steps: (1) Feeds knocked-down corrugated shipping containers into (2) a fully-mechanical case-forming mechanism (no air or hydraulic components are involved) from which (3) cases are positioned and end-loaded, ready for sealing and discharge. The machine is equipped with an automatic "filled-case" up-ender and discharge conveyor; engineered to work with standard top-bottom case sealers. Circle No. 2.

Bag Former, Filler, Sealer

Package Machinery Co. presents its Model TWB Transwrap, a bag forming, filling, and sealing machine with a cantilever movement and net weight scale. The Model TWB features an improved impulse polyethylene sealing mechanism and a new type of net weight scale. Bags up to 6" wide can be produced on the machine. The sealing unit for polyethylene is designed around the impulse sealing principle and includes a cold-wire cut-off. Seals are made at the extreme ends of the bag. An electrical current pulses through

a nichrome ribbon covered with a teflon web. This presses the polyethylene against a cold wire, and the result is a seal either side of the wire and a parting of the material where it contacts the wire. This method gives a 1/8" wide seal at the ends of the bag. Circle No. 3.

Foil Container Closing

Reynolds Metals Co. announces the development of Model 401 Reycon automatic closing machine. This machine automatically dispenses and closes up to 200 aluminum foil containers/min. A four-line unit, the machine is designed to handle Reynolds' 5"x5" Cass-Rol Pak container. It is available in one, two, three, or four-line units. Each unit is capable of 50 cycles/min., Reynolds says. A no container-no lid device prevents the discharge of lids when there is a break in the normal flow of containers. Approximately 7' long, 3' wide, and 5'6" high, Model 401 utilizes a five h.p. U. S. Vari-Drive motor and a Warner electric clutch. Circle No. 4.

Corrosion-Resistant Cans

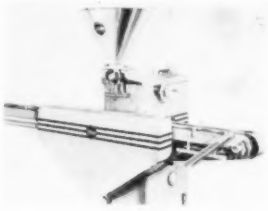
George D. Ellis & Sons, Inc., has a line of metal cans with sanitary, odorless, and tasteless wax linings that resist corrosion. A thick coating of 100 per cent hydro-carbon,

microcrystalline, petroleum, or other type of wax is hot sprayed into the finished can. The coatings

may be applied to any size or shape can which has an opening of 3/8" or larger. Overcoating with wax all seams, crevices, breaks, or scratches which may occur during manufacturing assures cans holding products that would normally be corrosive to tinplate or terneplate. Circle No. 5.

Tiny Container Filler

Hope Machine Co. presents a piston filling machine, Type 15 RC 1210, designed for filling 1/8 oz. to 2 oz. size containers. The machine features a high-speed Rex table top cross conveyor timed with the filling cycle. There is a no container-no fill control on the infeed conveyor. The piston assembly may be either single or double valve. Special manifold nozzles



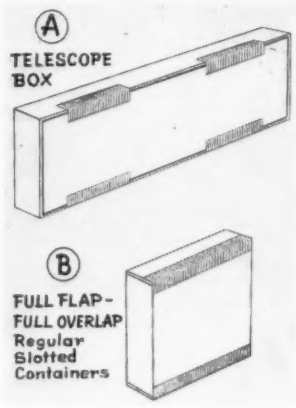
are provided with two to five nozzle tips for each manifold. Other features include an automatic discharge conveyor, provisions for filling up to ten containers at a time, and filling speeds ranging up to 200 containers/min. Circle No. 6.

"Zipper" Packages

Crown Zellerbach Corp.'s Western Waxide Div. announces the C-Zip pouch, made of moistureproof polyethylene and aluminum foil laminates. To open, the user simply tears a pre-cut corner and pulls. A tearstring cuts across the top of the pouch, making the opening. It is said that this technique can be applied equally well to pillow-type pouches when the tearstring is placed along one side of the packet. It also shows promise for containers using aluminum foil coated with heat-sealing lacquers. The pouch is constructed of 25-lb. pouch paper laminated with 7-lb. polyethylene to .00035" aluminum foil and coating on the foil side with 15-lb. (1 mil) polyethylene. A 3-lb. test thread is used for the tearstring. Circle No. 7.

Automatic Tape Sealer

General Corrugated Machinery Co. has developed a general tape sealer for automatically tape sealing two-piece, corrugated paper, full telescope cartons of many varieties. The machine applies lengths up to 8" of tape intermittently along



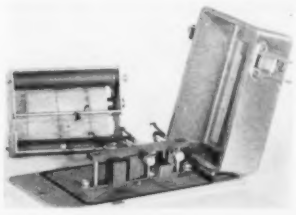
the length edge of the box. The result is a taped-joint between the cover and the bottom of the body of the box. The machine also tape seals full-flap, full-overlap corrugated boxes of regular slotted container variety. Circle No. 8.

Skin Packaging

Abbott Plastic Machine Corp. announces a new piece of equipment designed to prepare paperboard for the skin packaging process. The machine is a combination of three units. The first unit coats the surface of the paperboard with a liquid adhesive. As the master card passes through the coating machine, it is automatically dropped on a conveyor. The conveyor is equipped with special quartz infra-red heaters so the adhesive is perfectly dry when the master sheet arrives at the end of the conveyor. The paperboard then passes through the scoring machine, which scores the surface of the adhesive, allowing air to pass through the paperboard for the skin-pack process. Circle No. 9.

Impact Recorders

The Impact-O-Graph Corp. has introduced a shock recorder that



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INDUSTRIAL'S #7 AUTOPRINTER®!

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Post's Multi-Channel Input unit . . . accumulates "counts" from several different production lines where total count is desired, utilizes separate photoheads for each line. Anti-coincidence circuit keeps count accurate even if objects on two different lines break beam simultaneously.

Model SD-IT

Outmodes all mechanical counters. Capable of operating at speeds up to 100 units per second. Single "count" indicated on the six digit totalizer as each *tenth* item breaks the light beam. Counts dozens or gross with 12 place counting tube.

Model PW-5

Preset electronic counter with built in warning system. Available in models for counts of 1-100 (PW-2) to model with range 1-100,000 (PW-5). Will count in batches. Warning device may be used to coordinate secondary circuit just before desired count is reached. Will stop machine, cut, divert or perform any other operation. Automatically resets to zero when preset number is reached.

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"g" range (1 to 15 g's) with a higher natural frequency than before. Changes in design include the use of a rectangular mass instead of cylindrical, aluminum arms instead of brass, and a heavier spring. This doubles the natural frequency of similar stylus heads. The new bracket is housed in a case of cast aluminum which can be sealed against the elements. Circle No. 10.

Case Marker/Coder

Adolph Gottscho, Inc., announces a new Rolacoder conveyor and case-sealer attachment for marking and coding shipping cases automatically. This Series 300 Rolacoder imprints up to 3" in depth. Another feature is an improved high-capacity inking system and a reservoir which now holds an entire week's supply. A swing-out

mounting makes refilling of the ink reservoir easier. This marking machine is readily adaptable for imprinting the top, bottom, or either side of cases of various dimensions and will spot-print codes or other copy legends in almost any location on the case. Circle No. 11.

Bottle Filling Machine

Perl Machine Mfg. Co., Inc., has designed a filling machine for handling carton packed bottles up to 1 gal. in size. Known as the Perl Model CF, this machine fills by vacuum, gravity, or a combination of both. It can fill one or more cartons of bottles at once. The number of cartons filled at one time depends on the number of bottles in each carton and the number of filling spouts on the machine. Changeover from one bottle size to another is done quickly. On vacuum filling models, a heavy duty fan-cooled vacuum pump is housed in the cabinet. A special regulating valve permits setting the vacuum to any desired height. Circle No. 12.

Polyethylene Film

Visking Co., Div. of Union Carbide Corp., announces its Hi-Impact polyethylene film. This new film is designed for use where high impact and shock resistance are important for protection against rough handling by store personnel and customers. The film is said to be clearer and shinier than the standard "natural" Visqueen film usually used for produce packaging. Circle No. 13.

Wrapping Equipment

Robard Controller Co. has designed a wrapping machine known as the Robard Jr. It is an adjustable machine on which most heat-sealable materials can be used. It wraps a package without turning and handles packages ranging from 3/4" to 3" in height, 1" to 3" in width, and 2-1/2" to 8-1/2 in length. It features a no package-no paper device. If the flow of packages to the machine is interrupted, no paper is drawn for a wrapping operation. All main shafts are roller bearing mounted. Circle No. 14.

Pressure Sensitive Labeling

Avery Adhesive Label Corp. has designed an automatic labeling machine, Model 100, which will apply pressure sensitive labels of any size or shape in register on nearly all surfaces at assembly line speeds. Labels, die-cut and printed to specification, are furnished in rolls in various quantities up to 20,000 per roll. The labels are fed to an impressor which applies them individually to a specific position on the product or package to be labeled. This machine is suitable for mounting over conveyor motion at various angles. Circle No. 15.

Stringing/Knotting Equipment

Graeber Stringing and Wiring Machine Co., Div. of New Era Mfg. Co., has developed a fully automatic machine that strings, eyelets, and knots at speeds up to 11,000 pieces/hr. Known as the Whirlwind 185, this machine handles booklets, shipping, and merchandise tags in sizes ranging from 1" x 1-1/4" to 6" x 10". It handles string or cord from 2-5/8" to 6" lengths from hole in tag to knot, or 5-1/4" to 12" single lengths, using cotton, rayon, nylon, or polished cord up to #18 size. Three adjustments are necessary, including (1) setting the flexible tag magazine, (2) adjusting air suction slides to proper position for the tags, and (3) adjusting the string-length arm for the length of string desired. Circle No. 16.

Industry literature available free

1. Beneath each announcement is a code number. As you select items on which you want more information, *note* this number.
2. Now, *circle* the corresponding numbers on the postcard, located inside back cover.
3. Next, *fill* in your name and address.
4. Then, *mail* the card — we pay the postage.

Stretchable Paper

West Virginia Pulp and Paper Co. has a four-page brochure describing its Kraftsman Clupak, an extensible kraft paper. Kraftsman Clupak features a built-in stretch which allows the paper to yield on impact. Butt drop tests have shown stretchable paper to be tougher than regular kraft paper and to be able to absorb more energy. The new paper has a clean, smooth surface that is ideal for printing, Westvaco says. Circle No. **101.**

Marking Machines

Markem Machine Co. offers a new catalog describing its equipment for marking electrical and electronic components, products, and packages. With each machine, 25 in all, are shown the typical objects marked, and such data as major machine specifications, including imprint size and object size, operating speed, printing head, mounting, and dimensions. Information concerning what is available in printing elements, specialty inks, service, and technical help is also included. Circle No. **102.**

Photometer

American Instrument Co., Inc., has issued Bulletin No. 2295, which offers information on its absolute light-scattering photometer, a new instrument designed to measure turbidity, dissymmetry, sepolarization, and angular scattering. Detailed information on operating principles, internal design, representative instrument applications, and complete ordering details is included. The photometer permits studies of high-molecular-weight compounds, determinations of particle sizes in the micron and submicron ranges, and the recording of haze and turbidity in moving streams of liquid. Circle No. **103.**

Can Making Equipment

Callahan Can Machine Co. offers its General Catalog No. 1, which is profusely illustrated with pictures of different models in its line of can making and closing machinery. Specifications of each model are included The book illustrates can bodymakers, double end flanging machines, strip feed presses, gang slitters, double edging and notching machines, and seamers. These machines are designed to fabricate metal cans in many varieties of sizes and shapes, as well as to accomplish closing operations. Circle No. **104.**

Plastic Containers

Celluplastic Corp. has a colorful brochure illustrating a wide range of stock plastic vials and jars. The line includes rigid polystyrene vials from 3/8″ to 2″ in dia., with lengths up to 6″. Extruded flexible acetate and butyrate vials are available in diameters from 1/2″ to 1-3/8″, in almost any desired length. Also described is a line of squat jars in sizes up to 16 oz. The vials come in crystal clear plastic, as well as in a variety of colors. Multicolor printing of label or trademark is available. Circle No. **105.**

Tamper-proof Labels

Pee Cee Tape & Label Co. has literature on its tamper-proof, self-adhesive inspection labels. The descriptive brochure contains a "test it yourself" sample of this anti-sabotage inspection label. Once applied to a clean, dry surface, the label must be destroyed to be removed, making it impossible to re-apply an inspector's sticker to a part that has not passed inspection. The stock 1-1/4″ unprinted circular label readily takes an inspection stamp, pencil, pen, or typewriter marking. Printed inspection designs are also available. Circle No. **106.**

Interior Packing Material

Hinde & Dauch has issued a folder describing its Anchor Pak adhesive and cushioning material. Anchor Pak, a corrugated material, has a coating of pressure sensitive adhesive on the tips of the exposed corrugations to hold a product firmly in place. Its corrugations offer protection against shock, reducing damage from bumps and bounces. Small parts placed on the sheets can be counted at a glance and to facilitate handling, parts may be left on this material through testing and into assembly operations. Circle No. **107.**

Interlocking Steel Drums

Vulcan Containers, Inc., has a current folder giving details on its new 55-gal., interlocking Uni-Drums. These drums feature rolling hoops that are slightly offset, alternately raised and lowered, so that any number of drums may be utilized. This new feature is said to save shipping space and to reduce handling and shipping costs. Their six-point contact when banded minimizes scuffing, denting, and deformation because rotation, vertical, and horizontal movement is diminished, Vulcan says. Circle No. **108.**

Dual-Purpose Hoppers

Richardson Scale Co. offers Product Data Sheet 5704, which discusses the operating details, capacities, construction features, and methods of charging and discharging its dual-purpose hopper. This hopper was designed for the weighing or storage of fluffy, difficult-to-handle, dry materials. Details of construction and installation are shown in photographs and a schematic drawing. Circle No. **109.**

Cushioned Shipping Bags

Sherman Paper Products Corp. has a folder on its Corro-Bag cushioned shipping bags. These bags are made from a combination of corrugated sheet and kraft outer sheet. The corrugated sheet offers protection against shocks and blows. The closed end of a Corro-Bag is sewn through a double crepe strip with cotton thread. This is reinforced at the back of the bag by a bulky filler cord. Such fragile items as machine parts, electrical parts, phonograph records, plastic products, and jewelry are among the variety of things that can be shipped in these bags. Circle No. **110.**

Photoelectric Equipment

Autotron, Inc., offers Catalog 58, a 24-page book full of illustrations, descriptions, application diagrams,

and data on a variety of photoelectric equipment. Included are descriptions of normal, high-speed, ultra sensitive, and impulse actuated photoelectric controls; plug-in mounted photoelectric controls; photoelectric timing controls; a series of light sources; normal, small, and miniature phototube and light source heads; electronic timers; and controls operated by current surge and impact. Circle No. **111.**

Automatic Timing Device

Sun Tube Corp. announces the availability of drawings of its automatic timing device. This device accurately controls discharge for any predetermined period from 1 to 30 secs. Circle No. **112.**

Unit Load Carriers

The Mead Corp. offers a folder describing the characteristics of two types of carriers for unit loads, Chestnut Poke-Pak and Chestnut Glide-Pak. Poke-Pak is composed of virgin kraft and semi-chemical hardwood pulp, and is designed especially for shippers and receivers of bagged materials such as chemicals, minerals, pigments, etc. Poke-Pak supports any load your forktruck can lift, Mead says. The other carrier, Glide-Pak, is designed to handle unit loads of cartons, packaged goods, bags, and fibre and steel drums, and possesses a high tensile strength with great rigidity. Glide-Pak was manufactured for use with fork lift trucks having push-pull attachments. Circle No. **113.**

Pressure Sensitive Tape

The Connecticut Hard Rubber Co. has a data sheet describing its Temp-R-Tape pressure sensitive Teflon tapes. These tapes have silicone polymer adhesives and cover an application temperature range of —100°F. to 500°F. The mechanical applications of the tapes range all the way from an easy-to-apply, non-stick surfacing for heat sealing bars to low friction surfacing for film guides in sensitive electronic equipment. Circle No. **114.**

Parts Feeder/Bagger/Counter

Product Packaging Engineering has issued an eight-page bulletin describing its Pax-Mor packaging machine which feeds parts, heat seals, prints, cuts off, and counts bags automatically. The machine is adaptable to almost any small mechanical item, either in single or multiple pack. Speeds range up to 6,000 bags/hr. Practically all coated or laminated heat-sealable materials may be used for the bagging operation and rolls or stock up to 700 yds. in length can be accommodated. The Pax-Mor features electronic thermistor temperature controls for both upper and lower sealing rolls, rotary turntable feed, quick-change sealing sleeves, rubber plate type printer, adjustable speed motor, electric reset bag counter, and an exclusive safety cut-off. Circle No. **115.**

Rotary Heat Sealers

Doughboy Industries, Inc., offers an illustrated folder on its heavy-duty rotary sealer for cellophane, glassine, moisture barrier materials, foils, coated papers, and the like. Halftones and line drawings illustrate sealing details, equipment features, and types of bag top folders. Specifications and machine features are set forth. Circle No. **116.**

Film Overwrapping Machines

Bakelite Co., Div. Union Carbide Corp., has Technical Release No. 9, which discusses a continuous sealing system for automatic overwrapping machines using polyethylene films. The release includes charts and photographs illustrating the technical information offered. Circle No. **117.**

Automatic Capping

Consolidated Packaging Machinery Corp. has a six-page bulletin illustrating and describing eight different models of automatic capping equipment. Halftones of actual installations and a list of users accompanies the descriptive text and general machine specifications. Circle No. **118.**

Thread and Tape Bag Closer

Bemis Bro. Bag Co. offers a four-page bulletin, No. 272, describing the Tape-Top bag closing machine. This unit makes a standard sewn closure and immediately applies a pressure sensitive tape over the stitching, within a speed range of from 10 to 14 bags/min. This type of closure is useful in guarding against contamination, infestation, and sifting. Circle No. **119.**

Urethane Foam

Mobay Chemical Co. has a 20-page booklet reviewing the details of its urethane foams. Not only are their properties and performance features illustrated and described, but also a range of applications is included. Circle No. **120.**

Cushioning Material Evaluation

The Kimberly-Clark Corp. has a precision-made standard weight that applies a 3-1/2 lb. per square foot load to cushioning materials as required by federal specifications. It enables you to check the effective thickness (thickness under a standard load) of the cushioning material you are now using. This weight is free to all packaging engineers and cushioning buyers. Circle No. **121.**

Net Weight Scales

Hayssen Mfg. Co. describes its automatic net weight scales in a four-page bulletin. Featuring a Triple Vibrator feed for maximum accuracy, these machines are available in 2, 3, 4, 5, or 6 scale units. Circle No. **122.**

Versatile Wrapper

Miller Wrapping and Sealing Machine Co. describes its Model MPS wrapping machine in an information sheet. It wraps boxes or open trays of foods, textiles, drugs, stationery, etc., using roll or sheet fed wrapping materials. It heat seals or glue seals with cold glue. Speeds range up to 21 pkgs./min. Package sizes handled are 2-1/2" to 15" long, 1" to 9" wide, 12" to 5" high. Circle No. **123.**

Label Gluer

King Sales and Engineering Co. offers a two-page bulletin on its Model F6 label gluer. Line drawings illustrate machine details and halftones show in-plant usage. Detailed specifications are listed for motor- and hand-drive units. Circle No. **124.**

Case Sealing Adhesives

Swift & Co. offers a pamphlet on "Tempseal." This is a series of synthetic resin emulsions for easy-open case sealing. They bond quickly, yet open easily and cleanly. These adhesives have a high moisture resistance. They are delivered ready for use on high speed case sealers. Circle No. **125.**

Sheet Plastic Forming

Comet Industries offers an eight-page bulletin which describes its sheet plastic forming machines. Four different models are pictured and their specifications given. Circle No. **126.**

Honeycomb Cushioning

Union Bag-Camp Paper Corp., Honeycomb Dept., has Technical Service Bulletin H-1 which explains the construction, manufacture, and fabrication of honeycomb cushioning material. Available in varying thicknesses, with or without face liners, this material is made of kraft paper strips, spot-laminated in such a way as to produce honeycomb-shaped cells as the lamination is expanded. When pressure or shock is applied to the honeycomb facing, the entrapped air within the cells increases the cushioning effect. This material is relatively low in initial cost and is light in weight. Circle No. **127.**

Multicolor Printer

Cosom Engineering is offering a four-page illustrated brochure on its Cosomatic multicolor, multilevel printer. It prints letterpress or offset on flat, round, raised, or recessed articles—either production or small runs. Circle No. **128.**

Polyethylene Processing

U. S. Industrial Chemicals Co. offers a nine-page illustrated and bound file folder entitled "Polyethylene Tips." Reissued and brought up to date, this material includes information on the selection of polyethylene resins, as well as the effect of density, molecular weight distribution, and molecular weight on polyethylene properties. Details of twelve different U.S.I. petrothene polyethylene resins are included. Circle No. **129.**

Rust Inhibitor Paper

The Cromwell Paper Co. has a Technical Bulletin No. 655 which explains the characteristics and uses of "Ferro-Pak." This is a rust-inhibitor paper that is impregnated with a chemical that retards the corrosion of iron and steel parts due to moisture and oxygen. It is made to conform to MIL-P-3420. Offering protection of from six to twelve months in indoor storage, this paper may be corrugated or can be applied to cellulose wadding or to moldable materials; it is also available in bags, pouches, or sacks. Ferrous metal parts and machines can best utilize this material as a packaging component. Circle No. **130.**

Vacuum/Gas Pouch Packaging

Standard Packaging Corp., Flex-Vac Div., offers a four-page bulletin on

the Model 6-12 vacuum or gas pouch packaging machine. Fully automatic, this unit handles luncheon meats, ham, cheese, dried beef, frozen foods, etc., at speeds up to 60/min. Circle No. **131.**

Collapsible Metal Tubes

Standard Collapsible Tube Co. has a 16-page booklet describing its line of collapsible metal tubes. It explains the metals, coatings, and finishes used, and enumerates tube sizes, openings, caps, and applicator pipes available. Tube packing and shipping methods are also listed. Circle No. **132.**

Bag Paper Selector

St. Regis Paper Co. offers a slide rule type paper selector for multiwall bags. Related data appearing in the different slots and columns includes properties of papers, a description of the various types of papers, and a representative list of products using particular plies. Circle No. **133.**

Protective Transparent Packaging

Acme Backing Corp. lists the specifications for Acmeflex 15M50, a material made of Mylar coated with polyethylene. It is available in tubing, flat sheets, and rolls. Material can be sealed on any standard automatic equipment. Available in pink, white, or clear, it can be printed in four-color flexographic or gravure. Uses for this material include the packaging of jewelry, plated goods, small parts, tools, instruments, etc. Circle No. **134.**

Non-Drip Can

American Can Co. offers an eight-page booklet describing a non-drip container suitable for the packaging of a wide variety of liquid products such as edible liquids, detergents, window cleaners, liquid wax, tonics, shampoos, etc. A special nozzle provides free pouring that won't drip afterwards. The container fills quickly and easily, and is available from Canco plants throughout the U. S. Circle No. **135.**

Silicone Spray

Injection Molders Supply Co. offers an interesting twelve-page booklet describing the properties and uses of Silicone Spray. Available in an aerosol package, this spray is used to prevent sticking on hot plates, crimpers, gluers, sealers, etc. It also reduces friction on a packaging line. Circle No. **136.**

Corrugated Containers

Inland Container Corp. has a 32-page booklet containing a good deal of useful facts to consider when purchasing corrugated shipping containers. Discussion on some of the various types of board and corrugations is included, as well as some interesting information on the organization and development of Inland. Circle No. **137.**

Bond Tester

B. F. Perkins & Son, Inc., has literature and operating instructions on its Perkins-Southwick bond tester, an adhesion tester for resin coatings. The producer says this unit accurately measures the degree of adhesion between air-impervious coatings and paper. It determines the degree of adherence of the air-impervious coating or ply to the porous or semi-porous base. Circle No. **138.**

Fibre Cans

R. C. Can Co. manufactures a wide range of convolutely wound and spirally wound fibre cans that are illustrated with specifications in a current eight-page catalog. These packages are available in square, oval, round, and oblong shapes. Twelve different specialty metal-end tops are pictured, as well as illustrations of seven kinds of moisture and grease resistant wraps and liners that are available. Circle No. **139.**

Acetate Fibre Tapes

Minnesota Mining and Mfg. Co. has published a six-page illustrated bulletin describing its "Scotch" brand acetate fibre tapes. These are tapes with a cellulose acetate film backing which is reinforced with rope paper tissue. They are resistant to moisture, have high adhesion, are long-aging, and are available in twelve colors or transparent. A table is included which lists the thickness, tensile strength, stretch, and adhesion ratings for eight different types of this pressure sensitive tape. Circle No. **140.**

Parts and Hardware Packaging

Packmaster Sales Co. has a brochure describing three models of the Packmaster. An automatic machine, it loads and heat seals packets with oddly-shaped products, such as parts hardware, etc., in a variety of military and industrial flexible packaging materials. Speeds range up to 80/min. Circle No. **141.**

Hot Melt Coatings

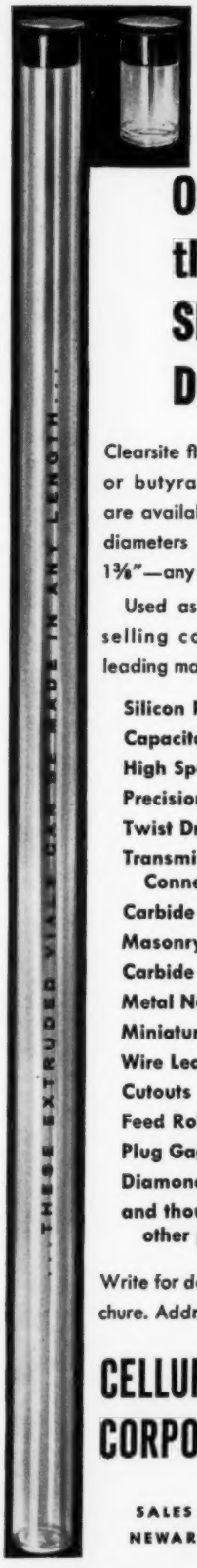
Boler Petroleum Co. has a folder describing Nicolmelt Molten coatings. These coatings and laminants eliminate the need for solvents; they are applied on paper the same way as wax. No drying ovens or heaters are required; they set up solid immediately upon cooling and high gloss is developed by running the web over a chill roll. A list of 20 packaging applications is provided which includes breadwrappers, folding cartons, paper bags, bakery trays, and boards. Circle No. **142.**

Pliofilm

The Goodyear Tire & Rubber Co., Inc., has prepared a brief, non-technical description of Pliofilm and its more common uses in Bulletin A-6427-K. Comprised of 18 pages of useful information, this booklet also lists tables showing the yield of Pliofilm in eight standard gauges as well as physical test data on 36 different grades of this material. Circle No. **143.**

Automatic Wrapper

Hudson-Sharp Machine Co. has a four-page folder featuring the Campbell Wrapper. This is an automatic machine handling all types of modern wrap materials, tube forming them around the product. It then simultaneously crimps, cuts, heat or glue seals, folds, and delivers. The machine gently handles hard, soft, and brittle products of regular or irregular shapes without breaking or crushing. It is said to reduce material requirements by 35 to 50 per cent. The unit wraps without boats or stiffeners unless they are desired, and can be supplied with such accessory equipment as code daters, label imprinters, strip opening attachments, etc. Circle No. **144.**



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Clearsite flexible acetate or butyrate containers are available in 10 stock diameters from ⅜" to 1⅜"—any desired length.

Used as shipping and selling containers by leading manufacturers of:

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- Miniature Tubes
- Wire Leads
- Cutouts
- Feed Rollers
- Plug Gages
- Diamond Dust
- and thousands of other products

Write for descriptive brochure. Address Dept. P

CELLUPLASTIC CORPORATION

SALES OFFICE:
NEWARK 5, N. J.

CROWN POLY PAPER IN ACTION:

Left: Printed, oil-proof Crown Poly paper is fed from roll.

Below: Another sale for skillful packaging.

How Crown Poly Paper Keeps Logs from Leaking

Leaking logs? Yes indeed! The Pak-A-Fyr people make artificial logs that burn without kindling, and the thing that makes them burn is a petroleum derivative in which the pressed wood waste is soaked before being wrapped in paper. The oil was leaking through the paper, spoiling the appearance of the product and impairing burning qualities. Pak-A-Fyr came to Crown Zellerbach for help. The research team developed a Crown Poly paper that kept the oil where it belonged—in the log—and improved the appearance and sales appeal of the logs as well. This is just one more problem solved by versatile Crown Poly paper. Is there a task Crown Poly can do cheaper, faster, more effectively for your operations? Write Department PY-3 at the address at right for technical assistance on any of your packaging problems.

CROWN ZELLERBACH
343 SANSOME STREET, SAN FRANCISCO 19, CALIFORNIA

Evaluating the performance of a packaging line

(*Continued from Page 26*)

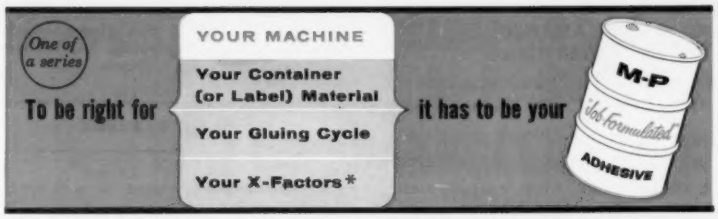
duction Department that it will accept responsibility for the line when it has operated for a predetermined length of time at a predetermined efficiency—for example, one day or one week at 80 per cent.

When efficiency has been demonstrated over the time agreed upon and those packages produced during that time have been at or above the minimum acceptable quality level, with fewer than the maximum permissible number of rejects, the line is ready for production. The minimum quality level of the packages, of course, must be adequate for sale although under some circumstances the line will be turned over to Production before the percentage of rejects and the line efficiency have reached a level fully satisfactory to management. This is in recognition of the fact that some sources of trouble are difficult to identify and correct on relatively short runs.

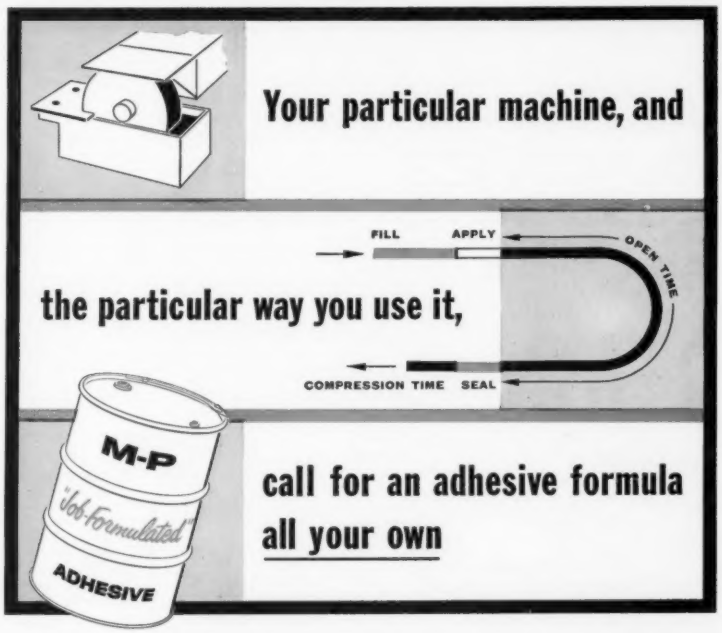
Summarizing: To determine when successful operation has been achieved it has been necessary to set up a system of evaluation of line performance. While the current state of development of the system we use is reasonably satisfactory, we are always seeking ways in which to improve it. Paraphrasing Admiral Rickover when asked about the Nautilis, "We are sometimes pleased at this stage of the game, but we are never fully satisfied until we have closely approximated ideal operation".

How is your organization?

Mr. Sutton's clear statement of the division of responsibility between the development group and Production emphasizes the importance of having a proper organization for managing the packaging function. Perhaps the logical starting point for development of an organizational structure is the preparing of clear and articulate statements of responsibility.



*X-TERNAL FACTORS: Temperature, Humidity, Dust, Accidental Down-Time, Product Density, Etc.



M-P technical service men balance dozens of attributes—low cost and high tack, resistance to severe machining, long open time and short compression time, good label wet-out and high suction tack, and many others—to provide you with the "job formulated" adhesive that's *just right* for your machine. To serve you quickly and efficiently, M-P has located service men in all principal cities. To get whatever help you may need, just fill-in and send us the coupon below. It will give us a good start on formulating an adhesive *just for you*.

MORNINGSTAR-PAISLEY, Inc.

630 West 51st Street, New York 19, New York
1770 Canalport Avenue, Chicago 16, Illinois

TO: MORNINGSTAR-PAISLEY, INC.
630 West 51st Street, New York 19, New York

Make of machine _____ ☐ Transfer Roll ☐ Direct Roll
Open time before pressure is applied _____
How long under pressure and how much _____
How soon is adhesion required after release of pressure _____
Conditions adhesive film must withstand _____

Name _____ Title _____
Company _____
Street _____ City _____ Zone _____ State _____

CLASSIFIED ADVERTISING

Our classified advertising section is intended for use by those wishing to buy or sell used packaging equipment, to employ packaging personnel, seek such employment, offer or seek business opportunities. It is not available for general advertising. Terms: Cash with order. Rates: Up to 60 words, $10.00. If boxed, $20.00. Over 60 words, $40.00 per column inch.

Circulation this issue in excess of 35,000

FOR SALE

For Sale — Ideal for boxboard lithography. Harris LT 119 2-color press 44 x 64, 1-15 HP motor, 1-2 HP motor, 2-phase 220 volts, 3 wire, 60 cycles . . . $5,000. Harris LF 125 1-color press 44 x 64, 1-10 HP motor, 1-2 HP motor, 2-phase 22 volts, 3 wire, 60 cycles . . . $3,000. F.o.b. New York. Please reply to Box 501, Package Engineering, 185 N. Wabash Avenue, Chicago 1, Illinois.

POSITIONS AVAILABLE

Jobbers & Agents — Wanted by well established, nationally known manufacturer of Package Conveyors and related packaging equipment, including Unscramblers, Accumulating Tables, Bottle Conveyors, etc. Send complete details of lines presently carried, major accounts, territory and experience. Areas now open include Louisiana, Mississippi, Alabama, Georgia and South Carolina. Exclusive arrangement if you qualify. Please reply to Box 502, Package Engineering, 185 N. Wabash Avenue, Chicago 1, Illinois.

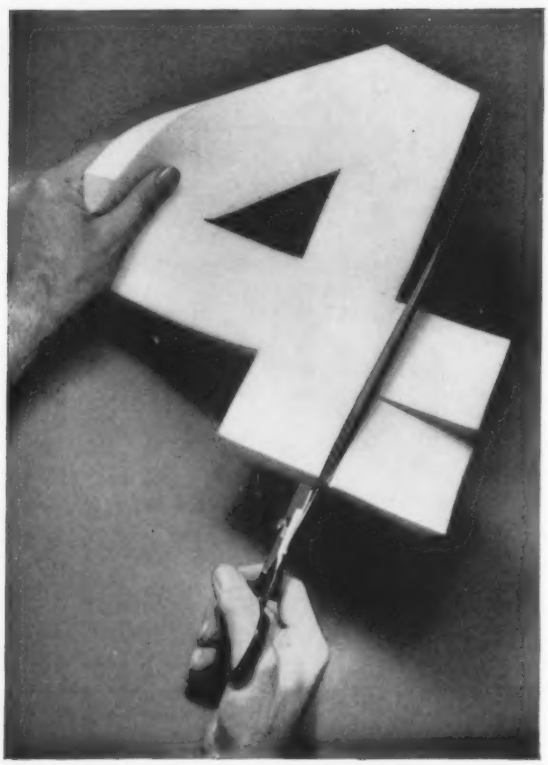
Sales Agents Wanted — For nationally known line of heat sealing machines. Attractive territories available. See display Booth 2225, National Packaging Exposition, New York Coliseum, May 26-30, 1958, or reply to Box 504, Package Engineering, 185 N. Wabash Avenue, Chicago 1, Illinois.

Industrial Design Engineer — This position requires technical knowledge of plastics, molding, glass, metals and component parts used in packaging, plus ability to direct and engineer design projects with company departments, vendors, design consultants, etc.

Midwestern manufacturer of nutritional and drug products placing great and increasing emphasis in packaging. We want a technically trained young man, age 25 to 38, who can grow and develop in this newly created position in our expanding design program.

Flexible salary structure. Liberal program of benefits, including life, medical and hospital insurance, sick leave pay, pension, bonus and stock option plans. Please forward a resume to Box 503, Package Engineering, 185 N. Wabash Avenue, Chicago 1, Illinois.

Please note our new rates for classified advertising, effective with the May 1958 issue. Up to 60 words, $10.00. If boxed, $20.00. Over 60 words, $40.00 per column inch.



good reasons to specify

URETHANE FOAM

FOR PROTECTIVE PACKAGING

1. Urethane foam's high shock absorbency permits containers to be more efficiently designed to fit the requirements of the product and to cut down on the need for "free space" in the carton.
2. Urethane foam's shock absorbency is directly related to its density; and since density is a factor that may be uniformly controlled in the manufacturing process, all that need be calculated is the thickness of the cushioning wall needed to absorb impact shock in a given situation.
3. The adaptability of urethane foam to diverse fabricating and packaging techniques is almost limitless. It can be molded in place to almost any conceivable contour for form-fitting protection; it may be sliced, cut, heat-sealed, sewn, stapled, tacked or die-cut to meet the most intricate requirements of package design.
4. The red tape of investigation, the inconvenience of delay, and the damage to both goods and reputation caused by inadequate packaging, are all sound reasons for talking with a urethane foam supplier.

Mobay is the leading supplier of quality chemicals, product development and technical assistance, to manufacturers of urethane foam for industry.

For further information and sources of supply for urethane foam, write—
MOBAY CHEMICAL COMPANY
Dept. PE-6, Pittsburgh 34, Pa.

MOBAY
First in Urethane Chemistry

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SEE the GENERAL SELF-SETTING TAPE SEALER for INTERMINGLED SIZES at the SHOW

Carton Tape Sealer for top and/or bottom flaps, also onto end panels as required.

GENERAL'S Tape Sealer, a natural for rule 41, tape seals* automatically up to 25 or more cases per minute, single-strip, top and/or bottom flaps only, plus end panels as required. Easier to open. Permits re-use. Makes dust and pilfer-proof seal. A great cost saver. Furthermore, this same machine seals the springy double wall container which is very troublesome for other makes.

GENERAL'S TAPE SEALER SAVES PRODUCTION TIME, HAS "NO EQUAL"

GENERAL'S Case Sealers have all the design features that engineered the un-equaled "General Line" for taping or gluing the "manufacturers-joint" in container manufacturing plants throughout the industry.

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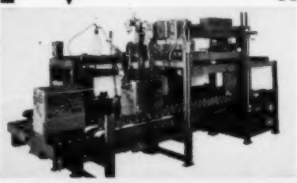

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What we think

Good news from Michigan State

Word that Michigan State University's governing board has approved the appointment of Henry G. Walter as executive director of the university's Packaging Foundation reaches us as a beacon ray cutting through the fog of today's confusion over higher education. Internationally known as a capable industrialist, Mr. Walter retired earlier this year as president of Gerrard Steel Strapping Division of United States Steel and as a director of the parent corporation itself.

Mr. Walter strikes us as just the man to spearhead the university's drive to raise $2,000,000 for the School of Packaging's building and facilities. His encyclopedic knowledge of packaging and related fields, his stature as a management figure, and his proven success in other charitable fund-raising activities make him a "natural" to carry and interpret packaging's needs to those who make their companies' decisions to donate.

Lack of space blocks growth of program

From a pioneering start in 1952, the packaging program at Michigan State has grown to the present enrollment of 148 undergraduates and 8 graduate students. As of last December, some 73 bachelor's degrees and 2 master's degrees had been granted to packaging students. Now, however, student enrollment in packaging is "frozen" by the limits of the school's inadequate physical facilities. If everybody takes a deep breath, they might get one more student in the packaging laboratory—and that's it.

Suggestions of raising funds for specialized training in packaging (and at a state-supported school at that) prompt many a raised eyebrow among educational sophisticates and corporate donors. Principal objections seem to be these:

(1) We need more training in basic sciences and less in specialized curricula.

(2) Packaging needs men of broad general education who acquire their specific training after they get on their jobs.

(3 Private enterprise should support private, rather than public, educational facilities.

(4) Such "practical" courses are inconsistent with America's long-range educational needs.

Answering these objections in order, we see that (1) while we do need people trained in the sciences, at the same time, the overriding demands of today's call for technically qualified packaging beginners requires prompt action.

(2) A general versus a technical education as a career basis has long been a question. It will be a topic for discussion as long as we have both types of institutions.

(3) Donors hesitating to support public universities should take note that Michigan State still has the only integrated degree program in packaging. Perhaps the university's remarkable growth is attributable to its unusual responsiveness to demands for new curricula.

(4) Pressing needs of the technical and operational packaging field for trained graduates more than justify immediate support of Michigan State's program. While we obviously must keep our long-range goals in view, we cannot wait for their actual fulfillment.

Packaging education needs fertile climate

When Michigan State's packaging program was in its infancy, Clive Megee, the assistant dean of agriculture, (now retired) succinctly summed up for us his university's objectives for the students: (1) Show them how to live together; (2) give them a broad basic education, and (3) give them a tool by which to earn a living after graduation.

Most people agree on the first two. It is the question or amount of emphasis on the third point that causes so much controversy in educational circles. Since no one can say for sure that he has the answer, it may be that in the long run, Michigan State's approach proves a workable compromise. It certainly bodes well for packaging.

If we are to have packaging graduates capable of meeting the challenges of the 60's, we had better see that Michigan State gets its $2,000,000 now. Regardless of what any other schools may do in the future, the fact is that here is a program that has proved itself and is already going strong. It deserves our full support.

Bruce Hollingsworth

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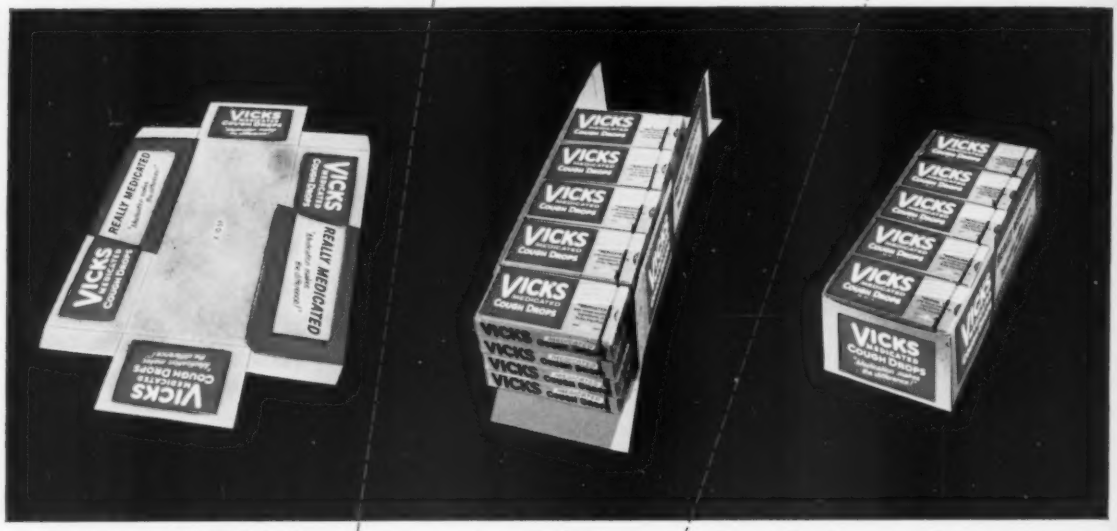
Automatic Tray Forming and Loading: Jones Tray Packer automatically feeds flat tray, forms it, inserts it in a rigid pocket, collects, stacks and inserts 20 Vicks cough drop boxes through end of tray, closes and seals flaps.

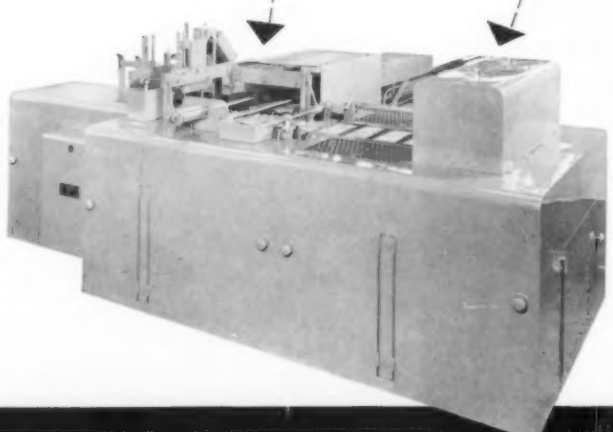


Save Material: With the Jones Tray Packer, you use the flat tray, the lowest cost container. Expensive pre-glued, snap-open tray is now outmoded.

Save Labor: Product automatically inserted thru the end. Eliminates manual top loading of pre-glued tray.

Save Equipment: Separate machinery for forming trays and transferring them to the loading stations no longer needed.

Cut tray packing costs automatically with the new JONES TRAY PACKER



Accelerated packaging line rates emphasize the need for a more efficient method of putting products into a tray (or shelf) pack. Jones meets this need with the new Nova Motion Tray Packer, the first machine to combine *automatic* tray forming with *automatic* loading.

This Jones machine, using only one operator, collects 540 Vicks cough drop cartons from four packaging lines to produce 27 trays per minute.

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